UNITED STATES OF AMERICA:
WAR DEPARTMENT.

MONTHLY WEATHER REVIEW.

(GENERAL WEATHER SERVICE OF THE UNITED STATES.)

SEPTEMBER, 1885.

PREPARED UNDER THE DIRECTION OF
BRIG. & BVT. MAJ. GEN'L W. B. HAZEN,
CHIEF SIGNAL OFFICER OF THE ARMY,

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PUBLISHED BY AUTHORITY OF THE SECRETARY OF WAR.

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WASHINGTON CITY:
SIGNAL OFFICE.
1885.

List of merchant marine steam and sailing vessels from which International Simultaneous Meteorological reports were received at the Office of the Chief Signal Officer, U. S. Army, Washington, D. C., in time to be used in the preparation of the Weather Review for the month of September, 1885.

	Name of vessel.	Observers.
	Allan Line.	
Br.	s. s. Circassian	Capt. Wm. Richardson.
	Grecian	C. E. LeGallais.
	Manitoban	R. Carruthers.
	Prussian	A. McDougall.
	Scandinavian	John Park.
	Sibeeian	R. P. Moore.
	American Line.	
Br.	s. s. British Princess	E. H. Freeth.
Am.	Indiana	R. W. Sargent.
Br.	Lord Clive	P. Urquhart.
	Lord Gough	E. M. Hughes.
	Anchor Line.	
Br.	s. s. Anchoria	J. J. Small.
	Australia	Alex. McRitchie.
	City of Rome	R. D. Munro.
	Elysia	James Brown.
	Ethiopia	John Wilson.
	Italia	Thos. Craig.
	Atlas Line.	
Br.	s. s. Ailsa	J. W. Sansom.
	Alvo	David Williams.
Span.	Andes	D. de Amézaga.
Br.	Claribel	T. M. McKnight.
	Booth's S. S. Co. (limited).	
Br.	s. s. Clement	Thomas Burley.
	Cyril	J. H. Johnson.
	Bristol-City Line.	
Br.	s. s. Brooklyn City	W. Fitt.
	Llandaff City	T. H. Gore.
	Canada Shipping Co.	
Br.	s. s. Lake Nepigon	M. L. Tranmar.
	Cunard Line.	
Br.	s. s. Aurania	W. H. P. Hains.
	Catalonia	Alex. McKay.
	Cephalonia	Henry Walker.
	Etruria	T. Cook.
	Gallia	M. Murphy.
	Pavonia	B. Woolfenden.
	Scythia	P. Whealan.
	Servia	W. McMickan.
	Edward Carr's S. S. Line.	
Ger.	s. s. Australia	G. Franck.
	Europa	L. A. Kessal.
	Polynesia	A. Kuhn.
	Furness Line.	
Br.	s. s. Durham City	M. P. Lund.
	Stockholm City	K. Doyle.
	General Trans-Atlantic Steamship Co.	
Fr.	s. s. Canada	G de Kersabiec.
	Germain	M. de Jousselin.
	St. Laurent	M. de Jousselin.
	Great Western S. S. Line.	
Br.	s. s. Dorset	Ch. Off. Wm. H. Bates.
	Guion Line.	
Br.	s. s. Abyssinia	Capt. J Price, R. N. R.
	Nevada	John Douglas.
	Wyoming	C. L. Rigby.
	Wisconsin	Edward Bentley.
	Hamburg-American Line.	
Ger.	s. s. Bohemia	R. Karlowa.
	Frisia	E. Kopff.
	Hammonia	H. F. Schwensen.
	Lessing	B. Voss.
	Moravia	O. Pezoldt.
	Rhaetia	H. Vogelgesang.
	Rugia	A. Albers.
	Suevia	C. Lndwig.
	Wieland	C. Hebich.
	Westphalia	H. Barends.
	Inman Line.	
Br.	s. s. City of Berlin	Francis S. Land.
	City of Chicago	Fred Watkins.
	City of Richmond	A. W. Lewis.
	Johnson Line.	
Br.	s. s. Nessmore	John Inch.
	Lamport & Holt's Steamship Company.	
Br.	s. s. Olbers	James Clarke.
	Plato	John P. Bevis.
	Leyland Line.	
Br.	s. s. Venetian	W. H. Trant.
	Virginian	M. Fitt.
	Mallory Line.	
Am.	s. s. Alamo	Sam. Risk.
	Colorodo	Jas. Daniels.
	Lampasas	M. B Crowell.
	Rio Grande	Jas. F. Lewis.
	San Marcos	A. C Burrows.
	Miss. & Dominion S. S. Co.	
Br.	s. s. Ontario	W. P. Couch.
	Toronto	Jas. McAuley.
	Monarch Line.	
Br.	s. s. Assyrian Monarch	John Harrison.
	Grecian Monarch	B. J. W. Bristow.
	Lydian Monarch	Thos. C. Huggett.

	Name of vessel.	Observers.
	Morgan's La. & Texas R. R. & S. S. Co.	
Am.	s. s. Chalmette	Capt. Robt. B. Quick.
	Lone Star	Geo. W. Mason.
	National Line.	
Br.	s. s. Canada	Wm. Pearce.
	Denmark	Geo. Cochrane.
	Egypt	R. W. Grace.
	Greece	A. J. Jeffrey.
	Helvetia	John Milligan.
	Holland	Wm. Tyson.
	Navigazione Generale Italiana.	
It.	s. s. Archimede	Domenico Viola.
	Indipendente	P. Pirandello.
	Gottardo	G. Diliberto.
	New York and Cuba Mail S. S. Co.	
Am.	s. s. Cienfuegos	C. M. Faircloth.
	N. Y., Havana & Mexican Mail S. S. Co.	
Am.	s. s. City of Alexandria	J. W. Reynolds.
	City of Washington	W. M. Rettig.
	North German Lloyd Steamship Co.	
Ger.	s. s. Donau	C. Pohle.
	Eider	H. Helmers.
	Elbe	F. Hamelmann.
	Ems	W. Willigerod.
	Fulda	R. Ringk.
	Main	H. Christoffers.
	Neckar	F. Pfeifer.
	Nürnberg	A. Jaeger.
	Salier	C. Wiegand.
	Werra	R. Bussius.
	Occidental and Oriental Steamship Co.	
Br.	s. s. Oceanic	John Metcalfe.
	Ocean Steamship Company.	
Am.	s. s. City of Augusta	K. S. Nickerson.
	Nacoochee	Ch. Off. C. G. S. Burg.
	Oceanic Steamship Company.	
Am.	s. s. Alameda	Capt. H. G. Morse.
	Mariposa	H. M. Hayward.
	Oregon Railway and Navigation Co.	
Am.	s. s. City of Chester	Thomas Wallace.
	Columbia	Fred Bolles.
	Oregon	E. Polemann.
	Pacific Coast Steamship Company.	
Am.	s. s. Orizaba	John N. Ingalls.
	State of California	G. Debney.
	Santa Rosa	C. B. Johnson.
	Pacific Mail Steamship Company.	
Am.	s. s. Australia	C. C. Brough.
	City of New York	R. R. Searle.
	City of Para	L. Dexter.
	City of Pekiug	G. G. Berry.
	City of Rio Janeiro	Wm. B. Cobb.
	City of Sydney	H. C. Dearborn.
	Colima	J. M. Caverly.
	Quebec Steamship Company.	
Br.	s. s. Bermuda	R. Fraser.
	Red "D" Line.	
Am.	s. s. Caracas	W. M. Hopkins.
	Philadelphia	Sam. Hess.
	Red Star Line.	
Belg.	s. s. Belgenland	W. A. Beynon.
	Nederland	Allen J. Griffin.
	Noordland	H. E. Nickels.
	Pennland	Rud. Weyer.
	Rhynland	J. C. Jamison.
	Switzerland	H. Buschmann.
	Waesland	J. Ueberweg.
	Westernland	Com. W. G. Randle.
	Rotterdam Line.	
Dtch.	s. s. Edam	Capt. J. H. Taat.
	Leerdam	P. Stierendregt.
	P. Caland	T. H. Bonjer.
	W. A. Scholten	G. J. Vis.
	Zaandam	A. Potjer.
	Royal Mail Steam Packet Company.	
Br.	s. s. Minho	W. Chapman.
	State Line.	
Br.	s. s. State of Georgia	G. Moodie.
	State of Nevada	John A. Stewart.
	State of Pennsylvania	Alfred Mann.
	Thingvalla Line.	
Dan.	s. s. Geiser	F. V. Schierbeck.
	Hekla	A. G. Thomsen.
	Island	W. Skjodt.
	Thingvalla	S. T. H. Laub.
	U. S. and Brazil Mail S. S. Co.	
Am.	s. s. Advance	Jas. R. Beers.
	Finance	Ch. Off. James Lord.
	Merrimack	W. L. Beers.
	Warren Line.	
Br.	s. s. Iowa	Capt. Samuel Walters.
	Norseman	E. Maddox.
	White Cross Line.	
Dtch.	s. s. De Ruyter	J. J. Brarens.
Belg.	Jan Breydel	H. Meyer.
	White Star Line.	
Br.	s. s. Adriatic	H. Parsell.
	Britannic	H. Perry.
	Celtic	Benj. Gleadell.

	Name of vessel.	Observers.
	White Star Line—Continued.	
Br.	s. s. Germanic	Capt. C. W. Kennedy.
	Republic	P. J. Irving.
	Wilson Line.	
Br.	s. s. Bassano	T. J. Moore.
	Chicago	J. W. Jones.
	Galileo	Richard Potter.
	Otranto	F. Kerr.
	Watts, Ward Line.	
Br.	s. s Richmond	Jacob Garson.
	Miscellaneous.	
Ger.	s. s. Brutus	J. A. Voege.
Br.	Camden	S. R. Chandler.
	Cranbrook	John W. Harvey.
	Dago	W. H. Bisset.
Am.	Lorenzo D. Baker	Warren F. Wiley.
Br.	Matthew Bedlington	Thomas Kirby.
	Rydal Water	J. H. Jones.
	"New York Herald Weather Service."	
Am.	s. s. Acapulco	W. G. Shackford.
Br.	Adriatic	H. Parsell.
	Ailsa	J. W. Sansom.
	Albano	H. R. Hughes.
	Alene	E. J. Selders.
	Alvo	D. Williams.
	Aurania	W. H P. Hains.
	Baltic	Robt. E. Bence.
Belg.	Belgenland	W. A. Beynon.
Br.	Bothnia	Thos. Robers.
	Britannic	H. Perry.
	Celtic	Benj. Gleadell.
Am.	Chalmette	Robt. B. Quick.
	City of Alexandria	J. W. Reynolds.
Br.	City of Berlin	Francis S. Land.
	City of Chicago	Fred Watkins.
	City of Chester	H. Condron.
Am.	City of Puebla	John Deaken.
Br.	City of Richmond	A. W. Lewis.
Am.	Colon	Chas. C. Lima.
	Crescent City	Jas. L. Lockwood.
Ger.	Eider	H. Helmers.
Br.	Elysia	James Brown.
Ger.	Ems	W. Willigerod.
Br.	Gallia	M. Murphy.
Dan.	Geiser	F. V. Schierbeck.
Ger.	Lessing	B. Voss.
Dtch.	P. Caland	T. H. Bonjer.
Belg.	Pennland	R. Weyer.
Br.	Republic	P. J. Irving.
Belg.	Rhynland	J. C. Jamison.
Am.	San Marcos	Ch. Off. A. B. Connor.
	Saratoga	Capt. John McIntosh.
Dtch.	Schiedam	G. Bakker.
Br.	Servia	W. McMickan.
Fr.	St. Laurent	M. de Jousselin.
Br.	State of Georgia	Geo. Moodie.
Belg.	Switzerland	H. Buschmann.
Dtch.	W. A. Scholten	G. J. Vis.
Belg.	Waesland	J. Ueberweg.
	Westernland	Com. W. G. Randle.
Br.	Wisconsin	Capt. Edw. Bentley.
	Wyoming	Chas. L. Rigby.
Dtch.	Zaandam	A. Potjer.
	Sailing vessels.	
Am.	bg. Abbie Clifford	David W. Storer.
	sc. Abbie H. Gheen	W. W. Ghees.
Ger.	sp. Agra	A. Högemann.
Am.	bg. Arcot	J. W. Cotes.
	bk. Antonia Sala	Ch. Off. Wm. Shaw.
Nor.	Artemis	Capt. E. E Moe.
Am.	Auburndale	J. W. Bowden.
Ger.	Betty	S. Wohlmuth.
Br.	sp. Charles S. Whitney	Geo. D. Spicer.
	bkt. Corisande	Daniel Thoms.
It.	bk. Creola	Egidio Gibelli.
Am.	sc. Emily Shepard	E. Coggins.
	Ettie H. Lister	Smith D. Mason.
	Florence Rogers	J. S. F. McLeod.
Dan.	bk. Galeon	H. H. Kalsboll.
Ger.	Godeffroy	C. H. Sinnig.
Am.	sc. Governor Hall	John Craig, jr.
Br.	sp. Hermion	F. N. Marvin.
Am.	bk. Idaho	W. S. Richardson.
Br.	Iodine	Adam Smith.
Am.	sc. James H. Gordon	W. Lawrence.
Br.	bk. Kryolith	Wm. C. Stephen.
Ger.	Leocadia	John Stohff.
Am.	Levanter	A. S. Vesper.
Br.	bg. Lilian	H. F. Schive.
Am.	sp. Lucy A. Nickels	Ch. Off. Wm. Oates.
	sc. M. B. Millan	Capt. F H. Dyer.
Br.	bk. Mistletoe	Israel L. Dunlap.
Am.	Mohican	Benj. F. Berry.
	sc. Nelson Bartlett	Samuel Watts.
	bkt. Payson Tucker	Charles Brown.
	bg. Raven	M. Nash.
	bkt. Sarah Doe	B. S. Merryman.
	sc. Sarah D. J. Rawson	Thos. P. French.
	sp. St. David	W. W. Frost.
	sc. Stephen Bennett	William Douglas.
Br.	bk. Strathmuir	A. W. Flemming.
	sp. Tsernogora	Augustus Cann.
Ger.	bk. Western Chief	Fr. Sander.

MONTHLY WEATHER REVIEW.

VOL. XIII. WASHINGTON CITY, SEPTEMBER, 1885. No. 9.

INTRODUCTION.

This REVIEW contains a general summary of the meteorological conditions which prevailed over the United States and Canada during September, 1885, based upon the reports from the regular and voluntary observers of the Signal Service and from co-operating state weather services.

Descriptions of the storms which occurred over the north Atlantic Ocean during the month are also given, and their approximate paths shown on chart i.

On the chart for this month are traced the paths of the centres of seven cyclonic areas; the average number for September during the last thirteen years being 9.4. The area described as ii developed great energy during its passage over the Lake region on the 8th and 9th, causing great damage to shipping interests, particularly on the upper lakes; and violent local storms and tornadoes occurred in Indiana, Michigan, and Ohio during the afternoon and evening of the 8th. The area described as number v was the severe hurricane on the Texas coast from the 15th to the 20th, whose centre remained nearly stationary, and which afterwards moved northeasterly along the Atlantic coast until its union with cyclonic area number vi near Eastport, Maine, on the morning of the 23d. This union was one of the remarkable features of the month.

The monthly mean temperatures were about normal in the southern districts east of the Rocky Mountains; they were slightly above the normal in the Rocky Mountain regions and on the Pacific coast; and below the normal from the upper Mississippi River eastward to the Atlantic coast.

In connection with the monthly precipitation, the most important feature is the very large excess over the average in the Gulf States, the rainfall being heaviest on the Texas coast in the vicinity of Galveston, where it amounted to 26.01 inches, or about one-half of the annual average for the last thirteen years. Marked deficiencies occurred in the middle Atlantic states, New England, the upper lake region, and extreme northwest.

The weather over the north Atlantic Ocean during the month was rough and unsettled; but few icebergs were observed in the route of trans-Atlantic steamers.

In the preparation of this REVIEW the following data, received up to October 20, 1885, have been used, viz., the regular tri-daily weather-charts, containing data of simultaneous observations taken at one hundred and twenty-nine Signal Service stations and seventeen Canadian stations, as telegraphed to this office; one hundred and seventy-nine monthly journals, one hundred and seventy-three monthly means from the former, and seventeen monthly means from the latter; two hundred and seventy monthly registers from voluntary observers; forty-four monthly registers from United States Army post surgeons; marine records; international simultaneous observations; marine reports through the co-operation of the "New York Herald Weather Service;" abstracts of ships' logs, furnished by the publishers of "The New York Maritime Register;" monthly weather reports from the New England Meteorological Society, and from the local weather services of Alabama, Georgia, Indiana, Iowa, Minnesota, Missouri, Nebraska, Ohio, and Tennessee, and of the Central Pacific Railway Company; trustworthy newspaper extracts, and special reports.

ATMOSPHERIC PRESSURE.

[*Expressed in inches and hundredths.*]

The mean atmospheric pressure for September, 1885, determined from the tri-daily telegraphic observations of the Signal Service, is shown by the isobarometric lines on chart ii.

The mean pressure is greatest over the Ohio Valley and middle Atlantic states, and least over the middle and southern Rocky Mountain regions. The isobar for 30.05 incloses the area of greatest pressure; and that for 29.8 incloses the area of least pressure. The highest barometric mean reported from Signal Service stations is 30.08, for Washington City and Norfolk, Virginia; the lowest is 29.79, for Fort Thomas, Arizona.

Compared with the mean pressure for the preceding month, there has been a decrease along the Gulf coast; also in the south Pacific coast region and along the northern boundary of the country from Minnesota westward to the Pacific coast. The largest deficiencies are, as follows: Port Angeles, Washington Territory, .09; Olympia, Washington Territory, and San Diego, California, .07; and Saint Vincent, Minnesota, .06. In all other districts the mean pressure is greater than for August, the excess ranging from .05 to .10 over the central Rocky Mountain districts, and over the greater part of the country to the east of the Mississippi River and north of the thirty-fifth parallel.

The departures from the normal pressure at the various Signal Service stations are given in the table of miscellaneous meteorological data, and on chart iv they are exhibited by lines connecting stations of equal departure. The mean pressure for September, 1885, is normal, or slightly above the normal, over the central Ohio valley and portions of the middle and south Atlantic states; it is also normal or above at scattering stations in the middle and southern Rocky Mountain regions. In all other districts the mean pressure is below the normal. The deficiencies nowhere exceed .09, and except in the Gulf States, north and south Pacific coast regions, at Mackinaw City, Michigan, and Eastport, Maine, where they range from .05 to .09, they are less than .05.

MONTHLY BAROMETRIC RANGES.

The monthly barometric ranges at Signal Service stations are also shown in the table of miscellaneous meteorological data. They were greatest in New England, and least over the southern parts of the country. The greatest and least monthly ranges are, respectively, 1.61, at Eastport, Maine, and .18, at Brownsville, Texas.

ANTI-CYCLONIC AREAS.

Seven of these areas crossed the country during the month; all, except numbers iii and vii, appeared first in the north Pacific coast region and crossed the mountains; all preserved the usual course, and only one, number vi, exhibited very great energy.

I.—This area was anti-cyclonic area number viii of the month of August; it was central in the Missouri Valley on the morning of the 1st, at which time light frosts were reported as having occurred in Dakota and Minnesota during the previous night. Generally fair weather prevailed during the 1st in all districts, except in the lower lake region, where light rains fell. Local rains also fell in South Carolina, Georgia, Arkansas, Missouri, and Illinois. Fresh westerly winds prevailed on the lower lakes and on the New Jersey coast on the same day. By the morning of the 2d this area had moved southeasterly and had embraced all the Atlantic coast states except Maine. On the morning of the 2d light frosts were reported in the Lake regions, but no particular damage resulted; and on the morning of the 3d light frosts occurred in New England. By this time this area commenced moving northeasterly with diminishing intensity. By midnight of the 3d the winds had shifted to southerly on the Atlantic coast, and local rains occurred in Virginia, on the Gulf coast, in Illinois, and in the Missouri Valley. The temperature rose during the 3d in all districts east of the Mississippi River.

II.—This area appeared in Washington Territory on the 1st and moved easterly to Montana, where it remained nearly stationary until the morning of the 4th; by the afternoon of this day the pressure had increased in Dakota and Montana, and there was quite a decided fall of temperature in Kansas, Colorado, Wyoming, and Montana. By the morning of the 5th this area was central in northern Dakota, and had gradually extended so as to cover the upper Mississippi and Missouri valleys as well as the states and territories just mentioned above, and frosts were reported as having occurred in the upper lake region and in the northern parts of the upper Mississippi and Missouri valleys. By the morning of the 6th this area had covered the lake regions and had extended to the Atlantic coast, with generally fair weather in all districts east of the Missouri Valley and north of North Carolina and Tennessee. On the morning of the 6th light frosts were reported in the upper lake region. By the morning of the 7th this area was central over New England, with the pressure from .10 to .16 above the normal. From this time the pressure gradually diminished. This area in its progress across the country was accompanied by the usual anti-cyclonic conditions. High winds prevailed on the Atlantic coast from Hatteras, North Carolina, to Block Island, Rhode Island, on the 5th and 6th under the influence of this area. On the 7th and 8th this area was diminishing in intensity.

III.—This area was first apparent on the afternoon of the 9th over Lake Superior, where it remained, without any special change, until the morning of the 10th, when the pressure had increased to about .10 above the normal. This area followed cyclonic area number ii, and produced clearing weather and fresh northeasterly winds on Lakes Erie and Ontario. By the morning of the 11th this area was central near Albany, New York, and the weather was generally fair, with nearly stationary temperature over the country east of the Missouri Valley, including also the Gulf States. On the Atlantic coast, on this date, fresh northeasterly winds prevailed. By the morning of the 12th this area was disappearing off the Atlantic coast, followed by cyclonic area number iii. The morning of the 13th showed this area still on the coast, with the pressure very near the normal.

IV.—This area appeared in the north Pacific coast region on the 13th, where, in the afternoon reports, there was shown a rise of .30 in twenty-four hours. By the morning of the 14th it had moved across the Rocky Mountains and was central in Montana, and extended to the Missouri Valley. By the morning of the 15th it was central in the Missouri Valley, with the pressure about .10 to .12 above the normal, and fair weather in all districts east of the Rocky Mountains, except in Texas, where there was considerable rain, accompanied by thunder. By the morning of the 16th this area had moved eastward and was central over the upper lake region. On this day the weather was generally fair and the winds were fresh northerly on the Atlantic coast. This area was attended by a fall of temperature of about ten degrees, but no decided cool wave. During the 18th and 19th this area remained on the Atlantic coast, but with decreasing intensity. By the afternoon of the 19th the winds had generally shifted to easterly in the south Atlantic and Gulf States, where abundant rains fell, particularly on the coast.

V.—This area appeared on the morning of the 16th in the north Pacific coast region, following cyclonic area number iv. By the morning of the 17th it had moved eastward and was central in the Missouri Valley, with a sudden rise of .40 in the twenty-four hours. At this time anti-cyclonic area number iv was resting over the middle Atlantic states. By the morning of the 19th these two areas seem to have joined, and covered the Lake regions, the Ohio Valley, and the middle Atlantic states. On the morning of the 20th this area covered the lower lake region, New England, and the middle Atlantic states, and was central near Ottawa, Province of Ontario, with the pressure there .30 above the normal; generally fair weather, with light, variable winds, prevailed throughout these districts. By the morning of the 21st this area was central over Nova Scotia, with an increase of pressure of about .15, and generally fair weather in all northern sections of the country. This area was followed by rapidly falling barometer, and cyclonic area numbers v and vi, the former from the west Gulf coast and the latter from the British Northwest Territory.

VI.—This area made its appearance in the north Pacific coast region on the morning of the 19th, but was not very definitely formed until the afternoon of the 21st, by which time it had spread over Montana and Wyoming, although still central over Washington Territory. By the morning of the 22d it had moved eastward and covered the Missouri Valley, and was central in Manitoba, with the pressure .25 above the normal. The pressure had risen rapidly after cyclonic areas numbers v and vi, particularly in the Lake regions, where, during the 22d, high northerly winds prevailed. This area was accompanied by quite a decided cold wave, the temperature falling from 20° to 30° in all northern districts. This area spread gradually eastward but the centre seemed to take a southeasterly course until the morning of the 24th, when it rested in Virginia. On this date frosts were reported in nearly all northern districts, but they were quite light, and ample warning had been given, so that little damage was reported to have resulted. By the morning of the 26th this area was central over Nova Scotia, having taken a northeasterly direction. During the 25th the barometer had risen very rapidly, the afternoon charts showing a rise of from .30 to .70 over New England and the Canadian Maritime Provinces. From the 26th to the 29th the pressure gradually decreased and generally fair weather, with slowly rising temperature, prevailed in all northern districts. This area, in conjunction with cyclonic areas numbers v and vi after their union on the 23d, produced high northwesterly winds on the Atlantic coast, all during the 23d.

VII.—This area was first apparent in the British Northwest Territory on the afternoon of the 28th. It moved easterly until the afternoon of the 30th, when it was central in the northern part of Minnesota. By midnight it was central north of Lake Superior; it produced no very decided changes in temperature, but abundant rains fell on the 29th and 30th in the upper Mississippi and Ohio valleys and in Tennessee, due, doubtless, to its influence.

CYCLONIC AREAS.

I.—This area was first noticeable on the afternoon charts of the 1st in Manitoba and the Northwest, where there was an abnormal fall of the barometer of .10; the centre could not be very definitely located at that time, but at midnight it seemed to be a little north of Minnedosa, Northwest Territory. By midnight of the 2d it was central over Lake Superior; at this time winds of considerable violence were experienced on the upper lakes, velocities of thirty miles at Escanaba, Michigan, and twenty-five miles at Marquette, Michigan, being reported. By the afternoon of the 3d the centre was north of Ottawa,

Province of Ontario, and in its progress eastward light rains had fallen in the Lake regions. By the morning of the 4th the centre was well to the north of Father Point, Province of Quebec; rains continued during the 4th in the lower lake region and in the Ohio Valley; these seemed to be particularly due to anti-cyclonic area number ii, which followed rapidly, bringing cooler northwesterly winds in these districts.

II.—This area commenced to be noticeable on the morning of the 5th by a general fall of the barometer in the Pacific coast districts, but it did not take definite shape until the morning of the 7th, when it was a well-developed storm in Colorado, Kansas, and Nebraska, and was central near West Las Animas, Colorado. Up to this time the weather had been controlled by two anti-cyclonic areas; cyclonic area number i having passed so far to the north as to have had little effect except in the Lake regions. On the afternoon of the 7th heavy rains fell in the Missouri Valley, the following being reported in the eight hours: Lamar, Missouri, 6.10 inches; Leavenworth, Kansas, 2.08 inches. The storm-centre at this time was a little to the northwest of Dodge City, Kansas, with the barometer slowly falling, and at Dodge City .27 below the normal. By the morning of the 8th the centre was just east of Des Moines, Iowa, where the barometer was .63 below the normal, the fall in the twenty-four hours having been .69. At this time high winds were reported on Lake Michigan and heavy rainfall in the upper Mississippi valley. The rain-area was almost a circle, one axis extending from Cleveland, Ohio, to North Platte, Nebraska, and another from Memphis, Tennessee, to Moorhead, Minnesota. By midnight of the 8th the centre was over Lake Michigan, and the rain-area had reached the Atlantic coast, where fresh southerly winds prevailed. Storm signals were ordered on the Lakes, and were far enough in advance to be of great benefit, although considerable damage was done to shipping. By the morning of the 9th the centre of the storm was over the southern part of Lake Huron; by the afternoon it had moved east-southeast to about Albany, New York, and by midnight was on the southeast coast of Massachusetts. During the day severe gales occurred on the lower lakes and during the night on the Atlantic coast from Cape Henry, Virginia, to Boston, Massachusetts. The influence of the storm was still felt on the 10th, the winds on the coast generally shifting to fresh northwesterly. From this point this storm is described under "North Atlantic storms," as number 5, in this REVIEW.

III.—This area also came from the Pacific coast and took definite form in southeast Colorado on the afternoon of the 10th, with the barometer .23 below the normal. By the afternoon of the 11th the isobar for 29.5, inclosing the storm centre, was quite a long oval extending from Huron, Dakota, nearly to Santa Fé, New Mexico. By the morning of the 12th the centre had moved northeasterly and was near Duluth, Minnesota, where a heavy rain, 1.78 inches, had fallen in the preceding eight hours. Rain had fallen generally in the upper Mississippi and Missouri valleys. On the afternoon of the 12th the centre was north of Duluth, Minnesota, and west of Prince Arthur's Landing, Province of Ontario. The gradient to the southeast of the centre was steep, and fresh southerly winds prevailed in the Lake regions. From this time until the afternoon of the 13th the centre described an abnormal track, making a loop in Manitoba. By the morning of the 14th it had moved easterly and was a little north of Prince Arthur's Landing, Province of Ontario. During the 13th rain had generally fallen in the Lake regions and in the Ohio Valley. During the 14th the path described by the storm-centre was normal, and on the morning of the 15th the centre was north of Father Point, Province of Quebec. During the 14th fresh south to west winds prevailed on the Atlantic coast, and westerly winds over the Lake regions.

IV.—This area came from the north Pacific coast region, and on the afternoon of the 15th was central north of Fort Custer, Montana. By the morning of the 17th the centre had moved in a direction slightly north of east and was north of Lake Superior. But slight energy was manifested by this storm, and by midnight the centre had moved northeasterly out of the limits of the Canadian stations; light rains fell in the Lake regions and in the Canadian Provinces.

V.—This storm raged on the Texas coast from the 15th to the 20th. The meteorological conditions over the country on the morning of the 15th were as follows: Anti-cyclonic area number iv was central in the Missouri Valley, and generally fair weather prevailed in all districts except in the west Gulf states. The winds were northeasterly on the Texas coast, and rain had fallen during the night of the 14th, and a thunderstorm, with light rain, was reported at Galveston, Texas. The barometer was very near the normal on the coast. By the afternoon of the 15th the wind was due east at both Galveston and Indianola, Texas, and northeast at Rio Grande City, Texas, indicating that the centre of the cyclone was somewhere to the south of these places; a maximum velocity of thirty-two miles was recorded at Indianola, Texas. By the morning of the 16th the rain-area had extended to New Orleans and Shreveport, Louisiana, and the winds were fresh northeasterly in the west Gulf states. This stormy weather continued until the morning of the 18th, when the storm-centre was pretty definitely located southeast of Indianola, Texas, and northeast of Rio Grande City, Texas. The storm-centre moved slowly northeasterly until the afternoon of the 20th. In the next twenty-four hours it had passed easterly across northern Florida and southern Georgia, and in the afternoon was southeast of Savannah, Georgia. This storm was the most protracted and the greatest rain storm in the record of the Galveston signal office, or within the memory of any resident of the city. The bark "Orient," with all her crew, four men and a boy, was lost at the entrance of the harbor on the 18th. The following table and note, taken from a carefully written special report of the observer at Galveston, gives the main features of this remarkable storm.

For twenty-four hours ending at 11 p. m.	Wind.			Mean daily barometer.	Daily rainfall.
	Max. velocity.	Total movement.	Prevailing direction.		
	Miles.	*Miles.*		*Inches.*	*Inches.*
September 15	15	200	e.	29.985	1.51
16	20	266	ne.	29.943	3.20
17	22	250	se.	29.977	1.90
18	30	560	e.	29.952	2.26
19	34	583	e.	29.874	3.39
20	35	401	ne.	29.854	4.27

NOTE.—Highest velocity during the storm, 35 miles; total movement of wind, 2,340 miles; highest barometer, 30.019, on the 15th; lowest barometer, 29.823, on the 20th; range of barometer during the storm, 0.196; total rainfall, 16.53 inches.

At Indianola the same condition of affairs existed as at Galveston during the same period of time, and quite a panic prevailed on the 19th. The wind attained a maximum velocity of sixty miles per hour, and 2.44 inches of rain fell during the day. The barometer was only .21 below the normal. High tides were reported on the 17th, 18th, and 19th. By the morning of the 20th all danger was considered past.

On the 20th rain fell generally in the east Gulf and south Atlantic states. On the 20th and 21st heavy rain fell at Smithville, North Carolina, Charleston, South Carolina, Savannah, Georgia, Jacksonville, Florida, and New Orleans, Louisiana. During the night of the 21st and during the 22d this area moved northeasterly along the coast, causing fresh gales. At midnight of the 22d the centre was southeast of Block Island, Rhode Island, where the barometer was .78 below the normal; an abnormal fall of .80 occurred in twenty-four hours. On the morning of the 23d the centre of this area and that of number vi came together near Eastport, Maine, where the barometer was 1.29 below the normal.

VI.—This area appeared in Manitoba upon the midnight chart of the 20th; by midnight of the 21st it had moved easterly and was central over the eastern end of Lake Superior; on the afternoon the centre was near Ottawa, Province of

Ontario, and up to this time no rain had fallen within the storm-area, but high gales occurred in the Lake regions. On the afternoon of the 22d rain fell in the lower lake region, and thunder-storms were reported. At midnight the centre was about midway between Father Point and Quebec, Province of Quebec; the pressure was about .60 below the normal. The gradient was steep from Marquette, Michigan, (30.10) to Father Point, Province of Quebec, (29.40). The barometer was lowest at the centre of area number v, which at this time was off Block Island, Rhode Island, and the barometer was 29.28. During the night of the 22–23d the storm was very severe on the New England coast. On the morning of the 23d the isobars were crowded together from Eastport, Maine, (28.80) to Rochester, New York, (29.82). Very high northwesterly gales prevailed on the Atlantic coast from Hatteras, North Carolina, to Portland, Maine, and on the lower lakes. On this day several lives were lost off the coast of Maine and considerable damage to shipping was reported; but the cautionary signal was displayed long enough in advance of the storm to be of benefit, and the display was favorably commented upon. By midnight of the 23d the storm-centre had moved northerly and was near Anticosti, Province of Quebec. On the 24th the centre was north of the Gulf of Saint Lawrence, and the barometer commenced to rise rapidly.

VII.—This area appeared to be central south of Mobile, Alabama, at midnight of the 24th. On the morning of the 26th a severe storm was in progress on the coast, with strong northeasterly winds at Mobile, Alabama, Pensacola, Florida, and New Orleans, Louisiana, and heavy rains fell at these places during the night. The centre seemed to remain nearly stationary until the morning of the 28th, and during the five days, from the 24th to 28th, the rain was almost continuous. By the morning of the 29th the centre was between Pensacola and Cedar Keys, Florida; fresh easterly winds and heavy rains were reported on the 28th and 29th on the south Atlantic and east Gulf coasts. On the morning of the 30th the centre was near Jacksonville, Florida, and by midnight the centre had passed easterly off the coast nearly over Jacksonville, Florida. Fresh northeasterly winds prevailed during the day on the south Atlantic coast. The storm was not of very great violence, although the rains were very heavy; and the barometer ranged about .30 below the normal.

The following table gives the latitude and longitude in which each area was first and last located, and the average hourly velocity:

Cyclonic areas.	First observed.		Last observed.		Average velocity in miles per hour.
	Lat. N.	Long. W.	Lat. N.	Long. W.	
	° ′	° ′	° ′	° ′	
No. I	50 45	100 00	51 15	64 30	26.9
II	38 15	103 30	41 30	70 15	28.8
III	37 45	103 45	51 00	68 00	30.4
IV	46 30	110 00	51 00	54 00	26.7
V*	22 30	96 30	50 30	61 00	18.6
VI*	51 15	101 30	50 30	61 00	28.8
VII	28 15	88 15	30 45	81 15	4.5
Mean hourly velocity					23.5

* Centres united in N. 45°, W. 68°.

NORTH ATLANTIC STORMS DURING SEPTEMBER, 1885.

[*Pressure expressed in inches and millimetres; wind-force by scale of* 0-10.]

The paths of the atmospheric disturbances that have appeared over the north Atlantic Ocean have been determined, approximately, from international simultaneous reports furnished by captains of ocean steamships and sailing vessels; abstracts of ships' logs and reports collected by the Signal Service agencies at the ports of New York, Boston, and Philadelphia; reports received through the co-operation of the "New York Herald Weather Service;" abstracts of ships' logs furnished by the proprietors of the "New York Maritime Register," and from other miscellaneous data received at this office up to October 22, 1885.

Of the twelve depressions shown on the chart, two, viz., numbers 5 and 7, were continuations of storms which had previously traversed the North American continent; two, numbers 2 and 4, were first observed over the northern part of the Gulf of Saint Lawrence, and three (3, 8, and 10) over Newfoundland and the Banks. Numbers 1, 6, and 11 appeared over the region east of the thirty-fifth meridian, the second being a somewhat severe storm which developed suddenly near the mouth of the English Channel. Number 9 was a hurricane which appeared within the tropics, and number 12 was a cyclonic storm of considerable energy which occurred near N. 40°, W. 60° during the closing days of the month. The data referring to these storms are incomplete, the paths of the storm-centres cannot, therefore, be determined at present.

The weather over the north Atlantic during September, 1885, was generally stormy and unsettled, especially over the region east of the fortieth meridian, with frequent marked fluctuations of the barometer, and moderate to strong gales, mostly from sw. to nw.

1.—This disturbance was shown near N. 50°, W. 25° on the 1st. On that day the reports from vessels between N. 47° and 50° and W. 15° and 30° indicated pressures ranging from 29.5 (749.3) to 29.75 (755.6), with strong winds to fresh gales from sw. to w. and n., while vessels to the northward of the fiftieth parallel had strong breezes to moderate gales from s. to e. and ne. The s. s. "Wisconsin," E. Bentley, commanding, had a strong breeze, with rain, at 8 a. m., of the 1st; wind veering to n., ne., and se. at noon, and then backing to e. at 2 p. m.; ne. at 6 p. m., and to n. at midnight, blowing a fresh gale. The lowest barometer, 29.64 (752.8), was observed at noon on the 1st, in N. 51° 12′, W. 24° 58′, remaining stationary at that value for about six hours. During the 2d and 3d the depression moved northeastward, with decreasing pressure, and on the last-mentioned date it was central near the Irish coast, with pressure about 29.25 (742.9). During the above dates strong gales from sw. to nw. occurred over the ocean westward to about the twenty-fifth meridian.

2.—This disturbance moved over the northern part of the Gulf of Saint Lawrence during the 2d, and on the morning of the 3d it was apparently central near the Strait of Belle Isle, with pressure about 29.2 (741.7). On the 4th the region of least pressure was near N. 53°, W. 38°, where the barometer read 29.4 (746.7); slight gradients existed over the ocean between W. 50° and the British Isles, and consequently the winds were moderate in force, not exceeding force 6 of the scale during the 4th. On the 5th, however, as the disturbance moved eastward with slightly decreased pressure, about 29.3 (744.2), near N. 53°, W. 28°, occasional w. and nw. gales of force 8 were reported to the southward and westward of the centre. On the 6th the centre of depression was near N. 52°, W. 15°, barometer 29.45 (748.0), with moderate to strong winds from s. to w. and n. On the following day the depression apparently passed over the British Isles.

3.—This depression appeared over the eastern part of the Gulf of Saint Lawrence on the 6th, on which date the centre of disturbance was apparently in Newfoundland, while strong wsw. and sw. winds and heavy rain, with barometer ranging from 29.6 (751.8) to 29.75 (755.6), were reported over the ocean between W. 50° and 55°. By the 7th the storm-centre had moved northeastward to about N. 52°, W. 38°, whe e the barometer ranged from 29.15 (740.4) to 29.35 (745.5), and moderate to strong gales from w. and sw. prevailed over the region between N. 45° and 50° and W. 30° and 40°. On the 8th the disturbance was shown near N. 55° and between W. 20° and 25°, the barometric readings to the southward of the above-mentioned parallel ranging from 29.6 (751.8) to about 29.85 (758.2) near N. 49°, while sw. and w. gales of force 7 to 8 continued between W. 20° and 30°. By the 9th the disturbance was apparently off the northwestern coast of Scotland.

4.—This was a slight depression which apparently passed off the Labrador coast on the 9th; as it moved eastward over the ocean a considerable decrease of pressure appears to have

occurred, and the area of disturbance increased in size, the barometer on the 10th, near N. 55°, W. 45°, falling to 29.3 (744.2) with strong s., sw., and w. gales over the ocean southward to the forty-fifth parallel. During the 11th and 12th this depression moved eastward north of the fifty-fifth parallel, with barometer on the former date about 29.1 (739.1), and falling on the latter date to 28.9 (734.0), when the storm-centre was near N. 56°, W. 15°; on those dates vessels between W. 35° and 15°, and to the northward of N. 50° reported strong wsw. to w. gales. On the 13th this disturbance passed to the northward of the British Isles.

5.—This was a continuation of the disturbance described as number ii, under "Cyclonic areas," in this REVIEW. After passing off the New England coast on the afternoon of the 9th, it moved northeastward, and on the 10th the centre of depression was near the southern coast of Newfoundland, where the lowest reported barometer reading was 29.5 (749.3), and strong ssw. winds to moderate sw. gales prevailed over the ocean to the eastward. On the 11th the centre of this depression was shown near N. 47°, W. 38°; the pressure varying from 29.25 (742.9) to 29.35 (745.5), with moderate s. to e. gales in the eastern, and very heavy n. and nw. gales in the western, semicircle of the depression. During the 11th the disturbance appears to have moved northeastward, passing beyond the fiftieth parallel, and on the 13th it was to the northward of N. 55° and between W. 15° and 20°, over which region the barometer remained low for several days. This depression, together with number 4, which moved at a higher latitude, caused a period of very unsettled, stormy weather over the Atlantic; trans-Atlantic steamers bound to the westward encountered first the westerly gales which prevailed in the southern quadrants of depression number 4, and then the ssw. to sw. and w. gales accompanying the second disturbance.

6.—This was a deep depression which appears to have formed near the mouth of the English Channel on the evening of the 10th, as indicated by the report of the s. s. "Salerno," B. H. Rogers, commanding; on the 10th at 10 p. m. that vessel encountered a strong gale, increasing to hurricane force from ssw., and shifting to w, and thence to n. and nne.; the lowest barometer observed (aneroid, corrected) was 28.89 (733.8), at 11 p. m. of the 10th, in N. 49° 38′, W. 7° 20′; the gale continued until 5 a. m. of the 11th.

Captain S. Wohlmuth, commanding the bark "Betty," reported at noon of the 10th, in N. 49° 53′, W. 4° 30°, barometer, 29.82 (757.4), wind hauling from ssw. to southerly and easterly; 2 p. m., light, drizzling rain, wind freshening; 4 p. m., strong sse. breeze, coming sometimes in puffs, barometer falling steadily and rapidly from .10 to .15 inch per hour, raining in torrents, wind increasing and hauling to se. At 6 p. m. sudden calm, and a quarter of an hour later it blew still harder than before from se.; at 7 p. m. it again fell light, and a heavy easterly swell was experienced; 7.30 p. m., clearing, sighted Lizard Lights nne., about 8 miles distant. At 8 p. m., barometer 29.19 (741.4), still falling; 8.30 p. m., wind nw., light for fifteen minutes, and occasionally going to n. and nne., then it came suddenly from nnw., blowing with hurricane force and accompanied by heavy rain. At this time, the foresail, foretopsail, and foretopmast staysail were blown away; the barometer had risen from 29.16 (740.7), the lowest observed, at a few minutes past 8, to 29.29 (744.0). The wind continued to blow a heavy gale until 11 p. m., when it began to decrease and the barometer rose rapidly.

7.—This was probably a continuation of the disturbance described as number iii under "Cyclonic areas." On the 16th it was central near the Strait of Belle Isle, whence it passed eastnortheastward, and by the 17th was shown near N. 54°, W. 35°, with pressure about 29.5 (749.3), and attended by fresh gales from wsw. and w. over the ocean southward to the fiftieth parallel. It moved eastward near the fifty-fifth parallel until the 18th, when it passed northeastward north of the British Isles.

8.—This was a slight depression which formed near the southern edge of the Banks on the 17th; it was accompanied by fresh gales from se. to sw., the pressure in the vicinity of the centre being about 29.65 (753.1) During the day it moved northeastward and apparently became merged in number 7.

9.—This was a hurricane which developed within the tropics on the 18th; the only data relative thereto, as yet to hand, are the following, and are insufficient to determine the path of the hurricane:

Captain W. H. Stapledon, commanding the s. s. "Sirius," bound from Rio de Janeiro to New York, reported: "At 6 p. m. on September 18th the wind backed from nne. to nnw., strong and squally, with heavy, irregular sea, wind increasing at midnight to a strong gale, with heavy squalls from nw.; lowest barometer (aneroid, corrected), 29.5 (749.3), at 10 p. m. of the 18th, in N. 17° 33′, W. 56° 4′. At 6 a. m. of the 19th, moderate ssw. gale, with high, irregular sea, and nothing visible above two hundred yards from the ship but white mist, which continued until the disturbance was past. Morning of the 20th, strong gale and high, irregular sea, with furious squalls and continuous heavy rain; 2 p. m. of the same date, gale moderating; 8 p. m., wind lulled, followed by sudden and violent gusts from w. to sse.; at midnight, strong sse. gale and heavy rain; ship laboring heavily and shipping immense quantities of water. September 21st, 8 a. m. (no position given), blowing a hurricane with heavy rain, barometer 29.7 (754.4), high, irregular sea from sw., sse., and se.; weather thick and misty, and continuing without abatement until midnight of the 21st, when it settled down to a moderate gale from se. by e."

Captain P. J. Fraser, commanding the s. s. "Flamborough," reported that on the 18th, when passing out by Sombrero (Windward Islands), he experienced strong ene. trades and a very heavy se. sea, which continued until the 23d.

The ship "Tsernogora," A. Cann, commanding, in N. 26° 10′, W. 63° 36′, had barometer (aneroid, error unknown) 29.98 (761.5), wind n. 80° e., force 5, with heavy showers of rain, long and heavy, rolling sea from se.; the barometer had steadily fallen from 30.17 (766.3) on the 17th, in N. 20° 08′, W. 56° 5′; the wind also having shifted from se. to ne.

Captain J. S. Garvin, commanding the s. s. "Orinoco," at Bermuda, reported that on the 20th a very heavy sea from se. began to roll in on the beach and continued until the evening of the 22d.

10.—This was a slight depression which appeared on the 20th; it moved rapidly northeastward without manifesting any great storm-energy, and during the 21st it apparently filled in over mid-ocean. During its passage the barometer ranged from 29.6 (751.8) to 29.7 (754.4).

The disturbance which moved northeastward along the coast of the United States during the 21st, 22d, and 23d (number v of "Cyclonic areas"), caused very stormy weather at sea; during those dates vessels between N. 30° and 40° and to the westward of the seventy-second meridian had furious gales from e. to ne., n, and nw., with barometer ranging from 29.3 (744.2) to 29.5 (749.2). On the 23d vessels to the northward of N. 40° and near W. 69°, had barometer below 29.0 (733.6). The brig "Erma," J. Neill, commanding, reported barometer 28.80 (731.5) at 12.20 p. m. of the 23d, in N. 42°, W. 69°; furious ne. gale, in which sails were blown away and the vessel sustained considerable damage. The s. s. "Suevia," C. Ludwig, commanding, at 1 a. m. of the 23d, in about N. 41°, W. 70°, had barometer down to 28.74 (730.0), with a strong gale from nw. for half an hour, when it decreased to a moderate gale and the barometer began to rise slowly. Vessels between W. 57° and 67° and north of 40° N., had strong gales from se. to sw., with barometer readings ranging from 29.2 (741.7) to 29.5 (749.3).

The s. s. "Camden," S. R. Chandler, commanding, encountered this storm during its passage over the Gulf of Saint Lawrence; Captain Chandler reported at 8 a. m. of the 23d (Greenwich date and hour), wind se., freshening rapidly, weather cloudy and rainy, and barometer falling; noon (posi-

tion, by account, being ten miles nne. from Bird Rocks), wind se., force 10, with furious squalls of rain, barometer (aneroid, error unknown) 29.7 (754.4), and falling rapidly; 4 p. m., same weather, wind occasionally falling light, barometer 29.41 (747.0); 8 p. m., wind blowing with great fury; 9 p. m., barometer reached its lowest, 29.15 (740.4), after which the wind and sea began to moderate; midnight, wind veering to southward, weather foggy, barometer 29.31 (744.5). At 8 a. m. of the 24th sighted Saint Paul's Island, barometer 29.52 (749.8), wind hauling to sw.

11.—This depression appeared north of the fifty-fifth parallel and east of the thirty-fifth meridian on the 27th. It apparently moved slowly in a southeasterly direction until the 29th, when the area of disturbance extended to the fiftieth parallel, and on the 30th the region of least pressure was near the northwestern coast of the British Isles. During the passage of this disturbance the barometer ranged from 29.4 (746.7) to 29.7 (754.4), and strong gales from ssw., sw., w., and nw. prevailed over the ocean between W. 40° and the British coasts and as far south as the forty-ninth parallel.

12.—A deep depression, showing considerable storm-energy, appears to have existed between N. 35° and 40° and W. 60° and 65° on the 28th and 29th; the data as yet to hand are insufficient to determine its origin and subsequent course, the following reports, however, indicate its presence over the region above-mentioned:

Captain Delap, commanding the bark "Mistletoe," reported as follows: "28th, strong gale from ne., heavy rains, and a long, heavy swell from sse., barometer gradually falling—at noon, Greenwich time, of the 28th, in N. 42° 30′, W. 60° 20′, barometer (aneroid, corrected) read 29.85 (758.2), wind ne., force 9—every appearance of a heavy storm; ran the ship w. by s., true, keeping the wind two to three points on the starboard quarter; at midnight (morning of the 29th) wind commenced to gradually haul to the northward; kept the wind three to four points on the starboard quarter; blowing with tremendous force, ship under reefed foresail; very heavy swell from east. Concluding that I was on the nw. edge of a cyclone, I ran the ship until 8 a. m. (ship's time), the wind being then nw. by n., with very high and cross sea. I then hove-to on the port tack, as I concluded that the centre was to the eastward. The barometer fell to 29.11 (739.4), the wind blowing with hurricane force, and accompanied by torrents of rain; the wind gradually hauled to w. at noon, ship's time, when it cleared up and the barometer began to rise; the heavy easterly swell continued from 4 p. m., ship's time, until the 30th." At noon, Greenwich time, of the 29th the barometer read 29.21 (741.9), wind nw., force 10, the ship's position being N. 39° 32′, W. 62° 15′.

The s. s. "Warwick," C. F. Lobbett, commanding, had a strong easterly gale on the 28th, increasing to a whole gale from ne. by evening of the 29th, with very heavy sea from se. The lowest barometer was 29.77 (756.1), at 8 a. m. of the 29th, in N. 41° 55′, W. 62° 0′, the wind shifting to ne. about the time of lowest barometer.

OCEAN ICE.

On chart i are also shown the eastern and southern limits of the region within which icebergs were observed during September, 1885. These limits are determined from reports furnished by shipmasters, and from trustworthy data published in the "New York Maritime Register" and other newspapers.

The easternmost icebergs were observed between the meridians of 46° and 47° W; and the southernmost bergs between the parallels of 45° and 46° N. They were few in number, and were mostly of small dimensions.

Compared with the chart for the preceding month (August, 1885), there is a difference of about four degrees of longitude in the positions of the eastern limits, that for the present month being about 4° west of that for August. The southern limit is about 2° north of that for the preceding month.

The following is a comparison between September, 1885, and the same month in the three preceding years:

Southern limit.			Eastern limit.		
Date.	Lat. N.	Lon. W.	Date.	Lat. N.	Lon. W.
	° ′	° ′		° ′	° ′
September, 1882	.....	.....	September, 1882	.....	.....
September, 1883	48 25	47 10	September, 1883	49 01	44 33
September, 1884	46 00	53 21	September, 1884	47 39	49 14
September, 1885	45 40	48 22	September, 1885	48 40	46 27

Icebergs were reported as follows:

September 1st.—S. S. "Elbe," in N. 46° 9′, W. 47° 5′, passed an iceberg at 5.30 p. m.; also passed another at 5.52 p. m., in N. 46° 7′, W. 47° 12′.

2d.—S. S. "Germanic," in N. 46° 0′, W. 47° 40′, passed five pieces of ice; s. s. "Holland," in N. 45° 51′, W. 47° 48′, passed a small iceberg.

13th.—Bark "Iodine," in N. 51° 0′, W. 50° 36′, passed two large icebergs.

19th.—S. S. "Hibernian," in N. 48° 20′, W. 47° 46′, passed two small icebergs.

21st.—S. S. "Neckar," in N. 47° 22′, W. 46° 54′, passed four icebergs, the largest being about one hundred feet high; temperature of air, 57°.2; water, 51°.8. The s. s. 'City of Chicago," in N. 47° 38′, W. 46° 44′, passed two large icebergs and some small pieces.

23d.—S. S. "Europa," in N. 47° 10′, W. 47° 15′, passed two icebergs; s. s. "British Prince," in N. 47° 14′, W. 46° 57′, passed three icebergs; s. s. "Adriatic," in N. 47° 11′, W. 46° 40′, at 5.45 a. m., passed a medium-sized iceberg and two small pieces near it.

25th.—S. S. "Nymphœa," in N. 48° 10′, W. 47° 14′, passed a large iceberg; s. s. "Amérique," in N. 48° 20′, W. 47° 18′, at 5 p. m., passed an iceberg.

26th.—S. S. "Jersey City," in N. 45° 40′, W. 48° 22′, passed a large iceberg.

29th.—S. S. "Norseman," in N. 48° 40′, W. 46° 27′, passed an iceberg about four hundred feet long and ninety feet high.

SIGNAL SERVICE AGENCIES.

Signal Service agencies have been established in the Maritime Exchange buildings at New York City and Philadelphia, and in the Custom-House, Boston, where the necessary blanks and other information will be furnished to ship-masters.

In pursuance of the arrangements made with the Meteorological Office of London, England, there were cabled to that office from New York during September, 1885, four reports concerning storms and icebergs encountered by vessels in the Atlantic west of the forty-fifth meridian; one message was sent from Boston.

TEMPERATURE OF THE AIR.

[*Expressed in degrees, Fahrenheit.*]

The distribution of mean temperature over the United States and Canada for September, 1885, is exhibited on chart ii by the dotted isothermal lines; and in the table of miscellaneous data are given the monthly mean temperatures, with the departures from the normal, for the various stations of the Signal Service.

In the Gulf States, Rio Grande Valley, Tennessee, extreme northwest, upper Mississippi and Missouri valleys, and middle slope, the mean temperature for September, 1885, has differed but slightly from the normal; the departures in these districts, as shown in the above table, average less than 1°. In the Lake region, Ohio Valley, and on the Atlantic coast, the month has been colder than the average September, the departures from the normal temperature being most marked in the lower lake region and New England, where the average departures, for the districts, were 2°.3 and 2°.9, respectively. In the northern slope, the plateau districts, and on the Pacific coast, the mean temperatures were above the normal, the departures being greatest in the northern slope, north Pacific coast region, and in the northern and southern plateau districts. The following are the most marked departures occurring at Signal

Service stations, the plus and minus signs denoting, respectively, above and below the normal: Fort Assinaboine, Montana, +4°.1; Fort Shaw, Montana, +3°.6; Wickenburg, Arizona, +3°.6; Lewiston, Idaho, +3°.4; Fort Apache, Arizona, +3°.0; Fort Maginnis, Montana, +2°.5; Olympia, Washington Territory, +2°.3; Oswego, New York, —4°.5; Portland, Maine, —3°.9; New Haven, Connecticut, —3°.7; Albany, New York, —3°.4; Mount Washington, New Hampshire, —3°.4; Block Island, Rhode Island, —3°.3; Chincoteague, Virginia, —3°.2; Hatteras, North Carolina, —3°.2; Rochester, New York, —3°.2.

In the following table are given the mean temperatures for the several geographical districts, with the normals and departures, as deduced from Signal Service observations:

Average temperatures for September, 1885.

Districts.	Average for Sept. Signal-Service observations.		Comparison of Sept., 1885, with the average for several years.
	For several years.	For 1885.	
	°	°	°
New England	62.1	59.2	— 2.9
Middle Atlantic States	68.0	66.0	— 2.0
South Atlantic States	74.4	73.4	— 1.0
Florida Peninsula	79.6	80.2	+ 0.6
Eastern Gulf States	75.0	74.3	— 0.7
Western Gulf States	76.1	75.8	— 0.3
Rio Grande Valley	80.6	80.4	— 0.2
Tennessee	70.2	70.3	+ 0.1
Ohio Valley	67.3	65.9	— 1.4
Lower Lake region	63.4	61.1	— 2.3
Upper Lake region	59.0	57.6	— 1.4
Extreme Northwest	54.8	55.2	+ 0.4
Upper Mississippi Valley	64.6	64.0	— 0.6
Missouri Valley	62 0	62.4	+ 0.4
Northern slope	55.2	56.9	+ 1.7
Middle slope	63.8	63.5	— 0.3
Southern slope			
Southern plateau	68.1	69.7	+ 1.6
Middle plateau	62.2	63.3	+ 1.1
Northern plateau	59.0	61.7	+ 2.7
North Pacific coast region	58.8	60.8	+ 2.0
Middle Pacific coast region	67.5	68.4	+ 0.9
South Pacific coast region	67.1	68.8	+ 1.7

DEVIATIONS FROM NORMAL TEMPERATURES.

In the table below are given, for certain stations, as reported by voluntary observers, the normal temperatures for September for a series of years, the mean temperature for September, 1885, and the departures from the normal:

Station.	County.	Normal temperature for September.	Number of years.	Mean temperature for Sept., 1885.	Departure.
Arkansas.		°		°	°
Lead Hill	Boone	72.2	4	70.0	—2.2
California.					
Sacramento	Sacramento	67.7	19	67.3	—0.4
Connecticut.					
Middletown *	Middlesex	61.4	27	59.1	—2.3
Dakota.					
Webster	Day	64.9	3	61.9	—3.0
Illinois.					
Anna	Union	69.3	10	69.2	—0.1
Collinsville	Madison	69.2	.....	66.4	—2.8
Mattoon	Coles	68.4	5	67.5	—0.9
Peoria	Peoria	66.7	30	66.6	—0.1
Riley	McHenry	60.6	24	59.8	—0.8
Sycamore	De Kalb	63.7	4	60.0	—3.8
Indiana.					
Lafayette	Tippecanoe	65.6	5	63.2	—2.4
Logansport	Cass	65.7	26	66.1	+0.4
Mauzy	Rush	65.3	6	64.8	—0.5
Spiceland	Henry	63.7	32	63.2	—0.5
Vevay	Switzerland	68.7	21	66.7	—2.0
Iowa.					
Cresco	Howard	59.4	10	57.8	—1.6
Monticello	Jones	61.5	31	60.5	—1.0
Kansas.					
Independence	Montgomery	70.2	14	67.8	—2.4
Wellington	Sumner	68.5	7	66.2	—2.4
Yates Centre	Woodson	68.3	5	65.8	—2.5
Maine.					
Belfast *	Waldo	60.2	26	57.6	—2.6
Bridgton *	Cumberland	59.1	11	56.3	—2.8
Gardiner	Kennebec	58.5	49	55.7	—2.8
Maryland.					
Fallston	Harford	65.7	14	63.2	—2.5
Massachusetts.					
Amherst *	Hampshire	60.2	48	58.4	—1.8
Cambridge *	Middlesex	61.8	63	58.2	—3.6
Fitchburg *	Worcester	59.9	29	56.9	—3.0
Lowell *	Middlesex	62.3	10	58.8	—3.5
New Bedford *	Bristol	59.2	73	58.8	—0.4
Springfield *	Hampden	63.1	18	60.7	—2.4
Somerset *	Bristol	64.2	15	61.6	—2.7
Taunton *	Bristol	64.4	15	59.0	—5.4
Worcester	Worcester	61.4	45	57.4	—4.0
Nevada.					
Carson City	Ormsby	60.1	.....	62.0	+1.9
New Brunswick.					
Saint John *	Saint John	54.7	25	52.4	—2.3
New Hampshire.					
Concord *	Merrimac	59.9	18	56.6	—3.3
Hanover *	Grafton	57.7	25	54.4	—3.3
New Jersey.					
South Orange	Essex	63.9	16	62.1	—1.8
New York.					
Menand Station	Albany	62.0	4	58.9	—3.1
North Volney	Oswego	60.8	18	57.9	—2.9
Palermo	Oswego	62.8	32	56.4	—6.4
Ohio.					
North Lewisburg	Champaign	64.2	53	64.8	+0.6
Wauseon	Fulton	62.9	15	60.7	—2.2
Pennsylvania.					
Dyberry	Wayne	59.2	19	56.8	—2.4
South Carolina.					
Statesburg	Sumter	73.6	5	71.8	—1.8
Texas.					
New Ulm	Austin	77.7	14	77.8	+0.1
Vermont.					
Lunenburg *	Essex	56.1	37	53.3	—2.8
Newport	Orleans	58.8	11	55.6	—3.2
Strafford *	Orange	59.6	11	58.0	—1.6
Woodstock	Windsor	56.7	18	55.1	—1.6
Virginia.					
Bird's Nest	Northampton	70.5	16	71.7	+1.2
Dale Enterprise	Rockingham	72.9	5	71.1	—1.8
Wytheville	Wythe	63.4	22	63.1	—0.3
Washington Territory.					
Bainbridge Island	Kitsap	58.5	8	60.0	+1.5
West Virginia.					
Helvetia	Randolph	61.7	9	59.9	—1.8
Wisconsin.					
Beloit	Rock	62.1	36	60.5	—1.6
Wausau	Marathon	56.4	.....	57.4	+1.0

* From the "Bulletin of the New England Meteorological Society."

Voluntary observers also report the following notes:

Riley, McHenry county, Illinois: the mean temperature for the first ten days of September, 1885, was 54°.3, the lowest recorded for any corresponding period during the last twenty-four years, and 10°.2 lower than the normal for the first ten days of September.

Monticello, Jones county, Iowa: the highest September mean temperature recorded in the last thirty-one years is 73°.1, for 1865, and the lowest, 51°.0, for 1856.

Fallston, Harford county, Maryland; during the last fourteen years the highest September mean temperature, 69°.4, occurred in 1884, and the lowest, 61°.3, in 1871.

North Volney, Oswego county, New York: the highest mean temperature for September during the last eighteen years is 69°.2, for 1881, and the lowest, 55°.7, for 1871.

Palermo, Oswego county, New York: during the last thirty-two years the highest mean temperature for September, 67°.8, occurred in 1881, and the lowest, 54°, in 1867.

Wauseon, Fulton county, Ohio: during the last fifteen years the highest September mean temperature, 71°.1, occurred in 1881, and the lowest, 57°.2, in 1883. The September extremes for the same period are: maximum, 100°.3, for 1881; minimum, 24°.9, for 1871.

Woodstock, Windsor county, Vermont: the highest mean temperature for September during the last eighteen years is 62°.6, for 1881, and the lowest is 49°.0, for 1871. The extremes for the same period are: maximum, 93°.0, for 1881; minimum, 22°.0, for 1871.

RANGES OF TEMPERATURE.

The monthly, and the greatest and least daily ranges of temperature at Signal Service stations are given in the table of miscellaneous meteorological data.

The monthly ranges were greatest over the plateau districts and in Montana, Dakota, and Minnesota; they were least in

the north Pacific coast region and at stations along the south Atlantic and Gulf coasts.

The following are some of the greatest and least monthly ranges:

Greatest.	°	Least.	°
Phœnix, Arizona	68.8	Key West, Florida	20.2
Fort Yates, Dakota	68.3	Fort Canby, Washington Territory	20.6
Poplar River, Montana	67.3	Indianola, Texas	21.7
Fort Totten, Dakota	66.6	Galveston, Texas	22.2
Saint Vincent, Minnesota	66.0	Cedar Keys, Florida	22.7
Lakeview, Oregon	65.0	Astoria, Oregon	23.0

Mr. H. D. Gowey, voluntary observer at North Lewisburg, Champaign county, Ohio, has forwarded to the Chief Signal Officer a temperature record covering a period of fifty-three years. The following is a summary of the record mentioned:

Month.	Normal temperature (53 years' observations).	Highest mean.	Year of highest mean.	Lowest mean.	Year of lowest mean.	Mean of maximum (53 years' observations).	Mean of minimum (53 years' observations).	Highest and lowest observed in 53 years.			
								Maximum.	Year.	Minimum.	Year.
	°	°		°		°	°	°		°	
January	27.7	41.0	1880	14.0	'56, '57	54.3	—3.4	70	1876	—26	1873
February	31.3	42.0	1857	19.0	1856	56.0	0.0	70	'57 '61	—22	1856
March	38.0	48.0	1842	27.0	1856	67.5	8.3	79	1875	—16	1839
April	50.6	59.0	1844	39.0	1857	79.0	25.2	86	1873	12	1881
May	61.2	67.0	1880	55.0	'57, '67, 1882	85.3	34.5	94	'74, '77	27	1876
June	68.9	73.0	1874	62.0	1839	88.8	46.0	97	'56, '58	33	1859
July	73.1	80.0	1868	68.0	1848	91.1	51.5	98	1881	43	1846
August	70.6	75.0	1880	64.0	1876	87.6	48.0	98	1874	34	1856
September	64.2	73.0	1881	55.0	1835	85.9	37.7	96	1854	28	1839
October	52.0	64.0	1879	43.0	1869	77.2	27.1	87	1877	18	1843
November	39.2	49.0	1849	29.0	1874	66.2	14.0	76	1876	—11	'57, '74
December	30.0	41.0	1877	19.0	1876	55.5	2.9	69	1875	—20	1884

NOTE.—The annual normal for the period of fifty-three years, as shown by the record, is 50°.82, the highest yearly mean being 54°.26, for 1846, and the lowest yearly mean 46°.80, for 1856, thus showing a range of 7°.46 in the annual means.

FROSTS.

Frosts occurred during September in the several states and territories, as follows:

California.—Fort Bidwell, 25th.

Colorado.—Pike's Peak, 1st, 5th, 6th; Fort Lewis, 7th, 9th, 12th, 13th, 25th, 27th, 28th; West Las Animas, 13th; Montrose, 13th, 27th to 30th.

Connecticut.—North Colebrook, 3d, 6th, 11th, 12th; Bethel, 3d, 6th, 11th, 24th; Hartford, 23d; New Haven, 24th.

Dakota.—Webster, 1st, 3d, 4th, 5th; Fort Buford, 1st, 3d to 6th, 12th, 26th, 27th, 29th; Bismarck, 1st, 3d, 4th, 5th, 17th, 30th; Fort Yates, 1st, 3d to 6th, 9th; Deadwood, 1st, 4th; Huron, 1st, 4th, 5th; Fort Totten, 1st, 5th, 6th, 15th, 30th; Vermillion, 4th; Fort Sully, 4th, 5th, 11th, 30th; Fort Bennett, 4th, 15th, 30th; Yankton, 5th;

Idaho.—Boisé City, 7th, 17th, 26th, 30th; Cœur d'Alene, 25th.

Illinois.—Chicago, 2d; Windsor, 2d, 6th, 13th; Sycamore, 2d, 6th, 23d; Charleston, 2d, 23d; Wilton Centre, 6th, 23d; Rockford, 21st; Mattoon and Riley, 23d.

Indiana.—Logansport, 2d, 6th, 23d, 24th; Lafayette, 2d, 23d; Spiceland, 2d, 23d, 24th; Laconia, 21st; Sunman, 21st, 24th; Indianapolis and Terre Haute, 23d; Greencastle, 23d, 24th; Vevay and Guilford, 24th.

Iowa.—Manchester, 1st, 2d, 5th; Cresco and Humboldt, 1st, 3d, 5th; Cedar Rapids, 2d, 5th; Burlington, 2d, 6th; Monticello, 5th, 23d.

Kansas.—Salina, 6th, 7th; Allison, 30th.

Kentucky.—Louisville and Frankfort, 24th.

Maine.—Cornish, 3d, 7th, 11th, 12th, 24th; Portland, 6th; Buckfield, 6th, 7th, 11th, 12th, 21st, 26th.

Table of comparative maximum and minimum temperatures for September.

State or Territory.	Station.	For 1885.		Since establishment of station.			
		Max.	Min.	Max.	Year.	Min.	Year.
		°	°	°		°	
Alabama	Mobile	90.4	59.8	96.0	1881	53.0	1871
Do	Montgomery	90.7	55.0	97.0	'75, '77, '84	51.5	1876
Arizona	Fort Apache	93.2	38.2	96.0	1883	32.0	1880, 1882
Do	Prescott	89.6	39.4	100.0	1879	29.0	1880
Arkansas	Little Rock	90.0	55.6	97.0	1881	47.0	1881
Do	Fort Smith	90.6	49.1	99.4	1882	39.6	1883
California	San Diego	89.5	56.5	101.0	1883	49.5	1882
Do	San Francisco	87.0	52.0	92.0	1877	50.0	1874, 1880 1881, 1882
Colorado	Denver	89.6	42.5	93.0	1878	28.0	1873
Do	Pike's Peak	47.3	13.0	55.0	1875	6.0	1876
Connecticut	New Haven	83.0	38.5	100.0	1881	35.0	1879
Do	New London	79.4	39.5	92.0	1881	37.0	1879
Dakota	Fort Buford	90.5	29.5	100.0	1882	18.0	1883
Do	Yankton	91.6	37.7	100.0	1881	26.0	1876
Delaware	Del. Breakwater			93.0	1881	51.0	1882
Do	Cape Henlopen	91.1	43.5				
Dist. of Columbia	Washington City	90.7	44.0	104.3	1881	38.0	1879
Florida	Jacksonville	92.5	67.9	98.0	1875	56.0	1874
Do	Key West	92.3	72.1	95.0	1872	71.5	1883
Georgia	Augusta	95.2	51.8	97.0	1875	48.0	1876
Do	Savannah	90.3	62.0	96.0	1876, 1877	54.0	1871
Idaho	Boisé City			96.0	1878	30.0	1881, 1882
Illinois	Cairo	85.4	50.6	97.0	1881	42.0	1876
Do	Chicago	81.3	47.1	93.9	1881	37.0	1872, 1876
Indiana	Indianapolis	83.8	38.4	94.5	1881	35.0	1875
Indian Territory	Fort Sill	91.0	52.5	100.0	1881	44.0	1878
Iowa	Davenport	83.0	44.9	94.0	1881	36.0	1879
Do	Keokuk	84.1	46.1	97.0	1881	39.0	'75, '76, '83
Kansas	Dodge City	88.0	48.0	99.3	1881	30.0	1876
Do	Leavenworth	85.5	46.0	101.0	1882	37.0	1876
Kentucky	Louisville	80.2	45.2	99.0	1881	42.0	1875, 1876
Louisiana	New Orleans	92.0	65.8	92.3	1884	58.0	1871
Do	Shreveport	95.2	54.8	101.0	1881	47.0	1881
Maine	Eastport	70.7	38.0	82.8	1884	35.0	1875
Do	Portland	82.1	38.3	94.5	1881	37.0	1875
Maryland	Baltimore	85.9	45.7	101.0	1881	40.0	1873, 1879
Massachusetts	Boston	84.3	38.7	101.5	1881	34.0	1879
Michigan	Alpena	88.0	37.0	93.0	1884	29.3	1883
Do	Detroit	81.3	40.7	97.0	1874	29.8	1883
Minnesota	Saint Paul	88.2	35.4	94.0	1878	30.0	1873
Do	Saint Vincent	82.2	24.0	89.0	1883	17.0	1883
Mississippi	Vicksburg	92.0	53.0	98.0	1881	48.0	1871
Missouri	Saint Louis	84.0	50.1	101.5	1881	40.0	1875
Montana	Fort Benton	93.4	33.6	95.0	1881	14.0	1873
Do	Helena	88.1	37.8	86.0	1880	30.0	1880, 1882
Nebraska	Omaha	88.9	45.5	98.8	1881	30.0	1873
Do	North Platte	90.0	42.9	101.0	1881	21.0	1876
Nevada	Winnemucca	88.4	30.8	94.0	1878, 1880,	22.0	1880, 1881
New Hampshire	Mount Washington	55.0	12.7	65.0	1880	11.0	1879
New Jersey	Atlantic City	80.6	44.0	94.0	1880	43.0	1875
Do	Sandy Hook	85.0	46.5	101.0	1881	40.0	1875
New Mexico	Santa Fé	81.0	40.0	90.0	1879	27.0	1880
New York	Buffalo	82.6	41.0	88.1	1884	35.0	1878
Do	New York City	83.8	43.5	100.2	1881	30.0	1872
North Carolina	Charlotte	89.1	47.6	94.0	1881	43.0	1879
Do	Wilmington	89.0	51.6	96.0	1872	47.0	1879
Ohio	Cleveland	84.2	43.9	98.0	1881	38.0	1875
Do	Cincinnati	84.2	40.9	95.0	1881	41.0	1875
Oregon	Portland	85.0	41.0	90.0	1876	39.0	'73, '77, '82
Do	Roseburg	89.9	37.8	90.0	1877, 1879	35.0	1877
Pennsylvania	Philadelphia	84.8	44.4	101.5	1881	43.0	1879
Do	Pittsburg	87.0	43.3	101.6	1881	35.0	1879
Rhode Island	Block Island	77.7	42.7	86.5	1881	41.5	1883
Do	Newport			88.3	1881	41.0	1879
South Carolina	Charleston	91.3	63.0	94.0	1870	54.0	1879
Tennessee	Knoxville	88.3	44.7	97.1	1881	40.0	1871
Do	Memphis	88.3	51.8	98.0	1881	44.0	1875
Texas	Galveston	90.7	68.5	94.0	1875, 1876	59.0	1875
Do	El Paso	93.2	48.9	104.0	1879	42.0	1880
Utah	Salt Lake City	90.0	42.4	93.0	1875	36.0	1881
Vermont	Burlington			90.0	1880	32.0	1875
Virginia	Lynchburg	90.7	46.2	98.3	1881	40.0	1875, 1879
Do	Norfolk	89.3	51.4	96.0	1880	50.5	1875
Washington Ter.	Dayton	88.4	36.0	91.3	1881	29.0	1881
Do	Olympia	73.9	43.2	81.0	1877	31.0	1877
West Virginia	Morgantown			91.0	1881	37.0	1875
Wisconsin	La Crosse	84.2	42.8	92.0	1873	31.0	1873
Do	Milwaukee	83.8	40.6	94.0	1872, 1874	32.0	1876
Wyoming	Cheyenne	84.8	34.2	88.0	1875	23.0	1878

Massachusetts.—Amherst, 3d, 6th, 11th, 12th, 21st, 24th; Rowe, 3d, 6th, 11th, 12th, 25th, 26th; Mendon, 10th; Westborough, 11th, 12th; Taunton, 11th, 12th, 20th; Heath, 12th; Deerfield, 12th, 21st, 24th, 25th; Dudley, 18th, 21st; Boston, 24th.

Michigan.—Harrisonville, 1st; Swartz Creek, 1st, 5th; Birmingham and Detroit, 2d; Manistique, 2d, 3d, 4th, 7th, 10th, 16th, 23d; Alpena, 2d, 6th, 11th; Lansing, 2d, 6th, 23d; Escanaba, 5th, 6th, 7th, 16th, 22d, 23d; Pentwater, 6th, 23d; Grand Haven, 6th, 23d, 24th; Boyne, 9th, 10th, 23d; Marquette, 10th, 23d, 25th; Traverse City, 22d; Mackinaw City, 23d.

Minnesota.—Northfield, 1st, 3d to 6th; Moorhead, 1st, 3d to 7th, 30th; Rochester, 1st, 3d, 4th, 5th, 18th, 23d; Duluth, 2d, 5th, 7th, 10th; Minneapolis, 3d, 5th, 6th; Saint Vincent, 4th to 18th, 29th, 30th; Saint Paul, 5th.

Montana.—Poplar River, 1st, 3d, 4th, 5th, 17th, 26th, 27th; Fort Maginnis, 5th; Fort Benton, 17th; Fort Shaw, 26th.

Nebraska.—Harvard, 8th; Valentine, 9th.

Nevada.—Carson City, 13th, 26th, 30th; Winnemucca, 26th.

New Hampshire.—Mount Washington, 2d, 5th, 11th, 23d, 24th; Antrim, 11th, 12th, 21st.

New Jersey.—Dover, 3d; Readington, 3d, 6th; Vineland, 24th.

New Mexico.—Fort Wingate, 6th; Fort Stanton, 25th.

New York.—Humphrey, 2d, 6th; Factoryville, 3d, 24th; Menand Station (near Albany), 6th, 7th, 11th, 24th; North Volney, 6th, 20th, 21st, 25th; Albany, 21st; Buffalo, 23d; Palermo and White Plains, 25th.

North Carolina.—Lenoir, Weldon, and Statesville, 24th; Flat Rock, 24th, 25th; Reidsville, 28th.

Ohio.—Toledo and Tiffin, 2d; Garrettsville, 2d, 6th, 17th; Wauseon, 2d, 6th, 17th, 23d; Napoleon, 2d, 6th, 23d; Jacksonborough, 2d, 23d; Westerville and Yellow Springs, 2d, 23d, 24th; Cincinnati, College Hill, North Lewisburg, and Portsmouth, 24th.

Oregon.—Linkville, 11th, 12th; Lakeview, 25th; Fort Klamath, 25th, 26th, 27th, 29th, 30th.

Pennsylvania.—Grampian Hills, 2d, 3d, 7th, 17th; Wellsborough, 2d, 23d; Dyberry, 3d, 17th, 18th, 20th, 21st, 22d, 24th, 25th, 26th; Troy, 5th; Wysox, 23d, 24th, 25th; Tidioute, 24th.

Rhode Island.—Narragansett Pier, 3d.

South Carolina.—Spartanburg, 24th, 25th.

Tennessee.—Ashwood, 21st; Milan and Nashville, 24th.

Vermont.—Stowe, 2d, 3d, 10th, 11th, 17th, 20th, 21st, 23d, 24th, 25th; Woodstock, 3d, 6th; Strafford, 3d, 6th, 7th, 11th, 12th, 20th, 21st, 25th, 26th; Dorset, 5th, 6th, 7th, 11th, 12th, 18th to 21st, 23d to 26th; Lunenburg, 6th, 7th, 11th, 20th, 21st, 26th.

Virginia.—Wytheville, 23d, 24th; Dale Enterprise and Bruington, 24th; Marion, 24th, 25th.

Washington Territory.—Dayton, 26th.

West Virginia.—Helvetia, 24th; Parkersburg, 25th.

Wisconsin.—La Crosse, 1st, 5th, 23d; Neillsville, 4th, 10th, 16th, 18th, 23d; Embarras, 5th, 6th, 7th, 23d; Wausau, 5th, 7th, 23d.

Wyoming.—Fort Bridger, 27th, 28th.

The following reports of injury to crops, etc., by frost, have been received:

Ada, Norman county, Minnesota: a heavy frost occurred in the county on the 1st, almost totally destroying garden vegetables.

Bird Island, Renville county, Minnesota: the buckwheat crop in this vicinity was almost totally destroyed by the frost of the 1st.

Foxborough, Norfolk county, Massachusetts: a heavy frost occurred in this vicinity during the night of the 2d–3d, causing considerable damage to vegetation.

Saint Vincent, Minnesota: reports from various parts of Minnesota state that the frost on the morning of the 3d caused considerable damage. In the vicinity of Moorhead and Willmar the corn crop was almost entirely ruined.

Adrian, Lenawee county, Michigan: it is estimated that the frosts of the 2d and 3d ruined about ten per cent. of the crops of corn, grapes, and tomatoes.

Berlin, Green Lake county, Wisconsin: much damage was done to the cranberry crop by the frost of the 5th.

Hudson, Saint Croix county, Wisconsin: the corn crop in this section was badly damaged by frost on the 5th.

Palmyra, Jefferson county, Wisconsin: considerable damage was done to tender vegetation in this vicinity by the frost of the 5th.

Colfax, Richland county, Dakota: the frosts of the 3d, 4th, and 5th destroyed nearly all garden vegetables in this vicinity; the temperature fell to 29° on the 5th.

Austin, Mower county, Minnesota: corn and garden vegetables were damaged to a considerable extent by frost on the 5th.

Northfield, Rice county, Minnesota: the heavy frost of the 5th caused injury to tender vegetation in the lowlands.

Portland, Maine: reports state that a heavy frost occurred on the 6th in the lowlands near Farmington, Franklin county, destroying corn, vines, etc.

Montrose, Colorado: a killing frost occurred on the morning of the 13th; garden vegetables in this vicinity were destroyed.

Madison, Wisconsin: the late corn was considerably damaged by the frost of the 23d.

Whitewater, Walworth county, Wisconsin: the heavy frost of the 23d caused considerable damage to vegetables.

ICE.

The formation of ice has been reported, as follows:

Dakota.—Bismarck, 3d; Fort Totten 4th; at the latter station ice formed to a thickness of one-quarter of an inch.

Michigan.—Manistique, 23d, first ice of season.

Ohio.—Napoleon, 2d: it has been reported from several localities, that ice formed as thick as window glass, causing considerable damage to corn and tender vines.

Wisconsin.—Embarras, 23d: thin ice formed during the night.

PRECIPITATION.

[*Expressed in inches and hundredths.*]

The distribution of rainfall over the United States and Canada for September, 1885, as determined from reports from more than eight hundred stations, is exhibited on chart iii.

In the following table are shown, for the several geographical districts, the normal September precipitation for a series of years, the average for September, 1885, and the excess or deficiency as compared with the normal:

Average rainfall for September, 1885.

Districts.	Average for September, Signal-Service observations.		Comparison of September, 1885, with the average for several years.
	For several years.	For 1885.	
	Inches.	*Inches*	*Inches.*
New England	3.33	1.74	−1.59
Middle Atlantic States	3.99	1.66	−2.33
South Atlantic States	5.84	7.14	+1.30
Florida Peninsula	5.22	10.34	+5.12
Eastern Gulf States	4.21	7.91	+3.70
Western Gulf States	4.56	8.34	+3.78
Rio Grande Valley	4.46	4.40	−0.06
Tennessee	3.24	4.68	+1.44
Ohio Valley	2.56	3.54	+0.98
Lower lake region	3.09	2.74	−0.35
Upper lake region	3.70	2.51	−1.19
Extreme northwest	2.35	1.19	−1.16
Upper Mississippi Valley	3.57	4.87	+1.30
Missouri Valley	2.27	3.47	+1.20
Northern slope	1.14	0.52	−0.62
Middle slope	1.60	2.26	+0.66
Southern slope			
Southern plateau	1.18	0.44	−0.74
Middle plateau	0.62	0.68	+0.06
Northern plateau	0.79	1.01	+0.22
North Pacific coast region	1.94	2.18	+3.24
Middle Pacific coast region	0.30	1.03	+0.73
South Pacific coast region	0.02	0.02	0.00

The precipitation along the south Atlantic and Gulf coasts was remarkably heavy, the average for the Florida Peninsula and Gulf States being nearly twice as great as the September normal. The rainfall at Galveston, Texas, exceeded by nearly seven inches the largest monthly precipitation (18.41, for September, 1875) recorded at that station since its establishment in 1871. Of this remarkably heavy precipitation, 16.53 fell from the 15th to the 20th. At New Orleans, Louisiana, the precipitation for September, 1885, has been exceeded in but two months during the last fourteen years, viz., 18.68, for May, 1873, and 13.62, for April, 1874, that for September, 1885, being 13.55, or 9.25 in excess of the average. At Jacksonville, Florida, 19.63 fell during the month, this amount having been exceeded in but one month, viz., 21.12, for September, 1878, since observations were begun in 1871. In the south Atlantic states, Tennessee, the upper Mississippi and Missouri valleys, the excess for the districts ranged from 1.20 to 1.44. At Red Bluff, California, the monthly rainfall was 2.91 (all of which fell on the 24th), or 2.49 in excess of the September average. The observer at that station reports that "this is the heaviest rainfall known to have occurred here since 1857."

In the southern plateau, western Texas, at Brownsville,

Texas, and over the northern districts from Montana eastward to the Atlantic coast the monthly rainfall has been below the average for September, the most marked deficiencies occurring in the middle Atlantic states and New England, where only about one-half of the average amount of rain fell.

The departures from the normal precipitation at Signal Service stations are given in the table of miscellaneous data.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows, for certain stations, as reported by voluntary observers, the average precipitation for the month of September for a series of years, the precipitation for September, 1885, and the departures from the average:

Station.	County.	Average precipitation for Sept.	Number of years.	Precipitation for Sept., 1885.	Departure.
Arkansas.		*Inches.*		*Inches.*	*Inches.*
Lead Hill	Boone	3.86	4	3.64	−0.22
Connecticut.					
Hartford	Hartford	3.01	13	2.26	−0.75
Middletown *	Middlesex	3.45	27	0.67	−2.78
Wallingford *	New Haven	3.53	27	0.75	−2.78
Dakota.					
Webster	Day	1.97	3	8.28	+6.31
District of Columbia.					
West Washington		3.48	4	2.62	−0.86
Illinois.					
Anna	Union	2.59	10	4.54	+1.95
Collinsville	Madison	2.99	.....	6.78	+3.79
Mattoon	Coles	2.84	5	5.30	+2.46
Peoria	Peoria	3.50	30	5.28	+1.78
Riley	McHenry	3.92	24	3.86	−0.06
Sycamore	De Kalb	3.36	4	6.10	+2.74
Indiana.					
Lafayette	Tippecanoe	2.21	5	4.64	+2.43
Logansport	Cass	2.90	26	5.00	+2.10
Spiceland	Henry	3.37	26	2.06	−1.31
Maxzy	Rush	2.66	6	2.47	−0.19
Vevay	Switzerland	3.43	22	3.08	−0.35
Iowa.					
Cresco	Howard	4.54	10	4.22	−0.32
Monticello	Jones	4.04	31	3.95	−0.09
Kansas.					
Independence	Montgomery	3.59	13	7.94	+4.35
Wellington	Sumner	4.28	7	5.31	+1.03
Yates Centre	Woodson	3.37	5	6.99	+3.62
Maine.					
Gardiner	Kennebec	3.26	47	1.98	−1.28
Maryland.					
Fallston	Harford	4.61	15	0.64	−3.97
Massachusetts.					
Amherst *	Hampshire	3.26	51	0.67	−2.59
Cambridge *	Middlesex	3.55	44	1.80	−1.75
Fitchburg *	Worcester	2.94	21	1.57	−1.37
Lake Cochituate *	Middlesex	3.43	34	1.64	−1.79
Lowell *	Middlesex	3.20	61	1.80	−1.40
New Bedford *	Bristol	3.57	72	1.85	−1.72
Springfield *	Hampden	3.36	38	1.01	−2.35
Somerset *	Bristol	2.98	15	1.15	−1.83
Taunton *	Bristol	2.23	11	1.01	−1.22
Waltham *	Middlesex	3.29	61	1.74	−1.55
Williamstown *	Berkshire	4.41	11	1.64	−2.77
Worcester	Worcester	3.32	43	0.87	−2.45
Nevada.					
Carson City	Ormsby	0.17	.....	0.06	−0.11
New Brunswick.					
Saint John *	Saint John	3.80	25	3.77	−0.03
New Hampshire.					
Antrim	Hillsborough	3.47	12	2.45	−1.02
Concord *	Merrimac	3.09	30	0.96	−2.33
Hanover *	Grafton	2.91	20	2.19	−0.72
New Jersey.					
South Orange	Essex	3.72	16	0.25	−3.47
New York.					
Menand Station	Albany	2.37	4	1.74	−0.63
North Volney	Oswego	2.87	14	3.30	+0.43
Ohio.					
North Lewisburg	Champaign	3.15	13	3.15	0.00
Wauseon	Fulton	2.41	13	2.14	−0.27
Pennsylvania.					
Dyberry	Wayne	2.40	15	1.04	−1.36
South Carolina.					
Kirkwood (near Camden)	Kershaw	5.43	19	2.34	−3.09
Statesburg	Sumter	4.24	5	3.48	−0.76
Texas.					
New Ulm	Austin	5.70	14	3.51	−2.19
Vermont.					
Lunenburg *	Essex	3.38	38	3.00	−0.38
Newport	Orleans	4.57	11	4.26	−0.31
Strafford *	Orange	3.70	11	2.70	−1.00
Woodstock	Windsor	3.06	17	2.35	−0.71
Virginia.					
Bird's Nest	Northampton	3.34	16	3.00	−0.24
Dale Enterprise	Rockingham	8.06	5	4.04	−4.02
Wytheville	Wythe	3.58	21	1.66	−1.92
West Virginia.					
Helvetia	Randolph	4.52	9	1.43	−3.09
Wisconsin.					
Beloit	Rock	3.55	35	4.56	+1.21
Wausau	Marathon	5.72	.....	2.06	−3.66

* From the "Bulletin of the New England Meteorological Society."

Voluntary observers also report the following notes:

Monticello, Jones county, Iowa: the largest precipitation for September during the last thirty-one years is 10.15, for 1881; no rain fell during September, 1871.

Fallston, Harford county, Maryland: the largest September precipitation during the last fifteen years, 12.95, occurred in 1876; the least, 0.23, in 1884.

Wauseon, Fulton county, Ohio: the largest September precipitation during the last thirteen years is 5.29, for 1879, and the least is 0.66, for 1874.

Woodstock, Windsor county, Vermont: the largest September precipitation during the last seventeen years, 6.77, occurred in 1882; the least, 0.76, in 1884.

Bainbridge Island, Washington Territory: the precipitation for September, 1885, 4.27, is the largest recorded in September during the last eight years.

HAIL.

Mackinaw City, Michigan: during the morning of the 4th a heavy hail storm occurred at Saint Ignace, distant about five miles. The hail-stones measured one-half inch in diameter.

Humphrey, Cattaraugus county, New York: a hail storm occurred a few miles west of this place on the 4th, causing considerable damage to crops. The hail-stones were from one-half to one inch in diameter, and some measured several inches in length.

Leonardtown, Saint Mary's county, Maryland: a violent hail storm visited this county about 5 p. m. on the 5th. The track of the storm was about three miles in width, and extended through the central part of the county for a distance of twenty miles. Great damage was done to the tobacco crop, fruits and vegetables.

Port Tobacco, Charles county, Maryland: the most destructive hail storm ever known in this part of the state occurred during the evening of the 5th. Entire fields of corn and tobacco were completely destroyed. The hail-stones were as large as pullet's eggs, and the destruction was general where the storm touched. The damage in Charles county is estimated at $100,000.

Hail storms are also reported to have occurred as follows:

1st.—Birmingham, Michigan; Mount Washington, New Hampshire; Santa Fé, New Mexico; Erie, Pennsylvania; Oswego, New York; Buffalo, New York; Swartz Creek, Michigan; Traverse City, Michigan.

4th.—Fort Pembina, Dakota; Pike's Peak, Colorado; Fort Supply, Indian Territory; Fort Scott, Kansas; West Leavenworth, Kansas.

5th.—Santa Fé, New Mexico.

6th.—Prescott, Arizona; Santa Fé, New Mexico; Sanford, Florida.

8th.—Jacksonborough, Ohio.

9th.—Greensborough, Alabama.

11th.—Fort Lewis, Colorado; Fort Sully, Dakota; Harvard, Nebraska; Marquette, Nebraska; Salt Lake City, Utah.

12th.—Montrose, Colorado; Salt Lake City, Utah.

13th.—Fort Assinaboine, Montana.

15th.—Neah Bay, Washington Territory.

23d.—Buckfield, Maine; Wellsborough, Pennsylvania; Brattleborough, Vermont.

25th.—Salt Lake City, Utah.

26th.—Cedar Rapids, Iowa.

27th.—Fort Supply, Indian Territory.

MONTHLY SNOWFALLS.

[*Expressed in inches and tenths.*]

The following monthly snowfalls have been reported:

Stowe, Vermont, 12.0; Strafford, Vermont, 9.0; Pike's Peak, Colorado, 6.2; Mount Washington, New Hampshire, 5.3; Dorset, Vermont, 4.0; Deadwood, Dakota, 2.5; Post Mills, Vermont, 2.0; Fort Bridger, Wyoming, 1.6; Lunenburg, Vermont, 1.1.

On the summit of Pike's Peak, Colorado, there remained at the close of the month four inches of unmelted snow.

Table of excessive and greatest monthly precipitation for September, 1885.

Station.	Specially heavy.		Largest monthly.
	Date.	Amt.	Amount.
Alabama.			
Roanoke			10.00
Bolling			9.67
Tuscumbia *a*			9.26
Mobile	4	3.23	9.25
Tuscumbia *b*	29, 30	3.87	7.37
Newton			7.35
Birmingham	20	2.00	6.97
Do	30	2.07	
Eufaula *a*			6.96
Evergreen	8, 9	2.06	6.61
Florence			6.59
Opelika	20	2.55	6.43
Carrollton			6.13
Eufaula *b*			6.06
Mount Willing			6.00
Arkansas.			
Arkansas City	19, 20	4.76	7.31
California.			
Red Bluff	24	2.91	
Dakota.			
Webster	7, 8, 9	3.00	8.28
Do	11, 12	5.28	
Yankton	7, 8	2.12	
Do	11, 12	2.53	
Fort Sisseton	11, 12	2.60	
Dist. of Columbia.			
Distrib. Reservoir	5, 6	2.95	
West Washington	4, 5	2.04	
Florida.			
Mayport	18 to 21	9.52	23.24
Do	26 to 29	13.72	
Jacksonville	19, 20	5.65	19.63
Do	26 to 29	11.27	
Manatee	11, 12, 13	5.97	13.68
Do	25, 26, 27	5.80	
Fernandina	19, 20, 21	4.50	13.16
Do	26, 27, 28	5.90	
Saint Augustine	19, 20	2.90	12.24
Do	24, 25, 26	4.88	
Archer	23	3.81	11.60
Do	20, 21	3.40	
Do	26	3.50	
Live Oak	5	2.00	11.18
Do	20	3.60	
Merritt's Island	25, 26	6.25	11.15
Sanford	11	2.76	10.73
Limona	10	2.23	10.64
Do	18	2.25	
Pensacola	26, 27	2.76	
Cedar Keys	26	2.83	
Key West	22, 23	2.12	
Tallahassee	26, 27	2.15	
Waldo	20, 21	2.06	
Georgia.			
Saint Mary's			27.40
Brunswick			22.08
Way Cross	19, 20	2.42	16.13
Do	26 to 30	11.70	
Ellerslie			14.00
Walthourville			12.70
Jesup	4	2.44	12.52
Do	27	7.82	
Savannah	20, 21	3.26	12.00
Do	27 to 30	5.50	
Griffin	20, 21	5.80	11.64
Do	27, 28	3.94	
Gainesville *a*			9.85
Carrollton			9.70
Milledgeville	20, 21	4.40	9.38
Do	26, 27, 28	4.30	
La Grange			8.85
West Point	20, 21	5.67	8.81
Dalton	20, 21	3.52	8.74
Do	30	2.13	
Forsyth	19, 20, 21	2.63	8.67
Do	26 to 30	4.50	
Athens	19, 20, 21	5.15	8.65
Newnan	27, 28, 29	4.70	8.08
Macon	27, 28	3.84	8.05
Eastman	19, 20	2.01	7.96
Do	27, 28	3.29	
Dahlonega			7.54
Cochran			7.45
Camak	20, 21	4.92	7.35
Allapaha	26, 27	2.51	6.95
Fort Valley			6.80
Gainesville *b*	20, 21	2.94	6.73
Thomasville			6.69
Atlanta	20, 21	2.00	6.51
Do	27, 28	2.44	
Toccoa	20, 21	3.54	6.29
Columbus	21	2.21	6.25
Quitman			6.00
Albany	26, 27	2.10	
Washington	20, 21	3.60	
Bainbridge	14	2.04	
Illinois.			
Collinsville	4	2.00	6.78
Do	12, 13	2.80	
Windsor	29	2.35	6.69
Sycamore			6.10
Mattoon	28, 29, 30	2.50	
Cairo	28, 29	2.18	
Bunker Hill	13	2.00	
Indiana.			
Marengo	2	2.20	10.20
Do	27 to 30	6.05	
Terre Haute	13, 14	3.36	9.33?
Do	28, 29, 30	4.70	
Princeton	28, 29, 30	4.70	6.80
Degonia Springs	27 to 30	4.48	6.12
Greencastle	13	2.40	6.01
Do	29, 30	2.38	
Laconia	29, 30	2.41	
Lafayette	12, 13	3.43	
Jeffersonville	29, 30	2.18	
Logansport	13	3.18	
Sunman	8	2.11	
Salem	28, 29, 30	2.36	
Brockville	13	2.00	
Worthington	28, 29, 30	2.53	
Dana	28, 29, 30	3.10	
Monticello	12, 13	2.61	
Fort Wayne	12	2.50	
Indian Territory.			
Fort Supply	27, 28	2.25	
Fort Reno	27, 28	2.10	
Iowa.			
Des Moines	7, 8	2.68	
West Union	7, 8	2.40	
Manchester	12	2.02	
Cresco	7, 8	2.00	
Kansas.			
Elk Falls	5	3.00?	10.75?
Do	11	4.00?	
Independence	11, 12	3.14	7.94
Leavenworth	4, 5	3.19	7.65
Do	7, 8	2.86	
W. Leavenworth	4	3.20	7.50
Do	6, 7	3.05	
Wyandotte	3, 4	3.13	6.83
Do	6, 7	2.13	
Concordia	7	2.81	
Topeka	7	2.18	
Atchison	6, 7	3.00	
Wellington	7	2.37	
Emporia	4, 5	2.12	
Westmoreland	7	2.00	
Kentucky.			
Louisville	29, 30	2.28	
Louisiana.			
New Orleans	19, 20	3.97	13.55
Do	26	3.23	
Grand Coteau	3	2.50	10.58
Do	15	2.75	
Point Pleasant	9, 10	3.82	9.79
Luling	19, 20	3.81	9.44
Lafayette	14	2.15	7.70
Do	19, 20	2.43	
Liberty Hill	5	2.10	7.66
Do	9	2.50	
Shreveport	5, 6	2.87	6.70
Monroe			6.51
Natchitoches			6.25
Coushatta	9, 10	2.07	
Maine.			
Petit Manon			6.50
Eastport	22, 23	2.28	
Michigan.			
Alpena	8, 9	3.05	
Grand Haven	8, 9	2.89	
Harrisville	8	2.50	
Minnesota.			
Northfield	7, 8	2.95	
Minneapolis	11	2.51	
Rochester	7, 8, 9	2.49	
Duluth	11, 12	2.20	
Mississippi.			
Edwards	5	4.90	12.15
Do	9, 10, 11	4.31	
Jackson	5	4.93	10.32
Vicksburg	5	2.24	9.28
Do	9, 10	3.06	
Columbus	19, 20	2.01	6.97
Holly Springs	28	3.55	6.89
Batesville	5, 6	3.24	6.86
Aberdeen	20	2.00	6.83
Fort Gibson	10, 11	2.92	6.01
Brookhaven	26	2.00	
Oxford	29, 30	2.65	
Missouri.			
Lamar	4, 5	2.60	13.24
Do	7	2.68	
Do	12, 13	2.50	
Saint Louis	3, 4	3.63	8.98
Do	12, 13	3.32	
Independence	3	2.35	8.36
Greenfield			7.60
Mexico			7.51
Sedalia			7.19
Pierce City	5	2.00	6.90
Do	8	2.00	
Lexington			6.51
Shelbina			6.40
Centreville	13	2.00	6.26
Do	30	2.20	
Springfield			6.15
Houstonia			6.00

Table of excessive and greatest monthly precipitation for September, 1885—Con.

Station.	Specially heavy.		Largest monthly.
	Date.	Amt.	Amount.
New York.			
Madison Bar'cks	8, 9	2.60	
Palermo	8, 9	2.40	
North Carolina.			
Hatteras	21, 22	6.86	7.27
Smithville	21	6.51	6.94
Fort Macon	21	6.02	6.31
Lincolnton	30	2.30	
Wilmington	21	4.74	
Charlotte	21, 22	3.20	
Kitty Hawk	21, 22	4.60	
New River Inlet	21, 22	5.29	
Ohio.			
Jacksonburg	7, 8	3.50	
North Lewisburg	8	2.70	
Upper Sandusky	8	3.25	
Yellow Springs	8	2.07	
Washington C.H.	8	2.00	
Waynesville	8	2.70	
Springborough	8	2.97	
South Carolina.			
Yemassee	19, 20	2.90	7.37
Hardeeville	27, 28	2.99	
Greenville	20, 21	3.10	
Anderson	20, 21	3.75	
Batesburg	21	3.37	
Tennessee.			
Grand Junction	27, 28	4.10	6.80
Waynesborough	28, 29	4.76	6.66
Chattanooga	20, 21	2.79	6.48
Do	29, 30	2.05	
Nashville	29, 30	3.35	
Bolivar	27, 28	2.51	
Parksville	20	2.00	
Grief	20	2.70	
Fostoria	20	2.70	
Do	29	2.00	
Tennessee—Con.			
Cookeville	29, 30	2.10	
Riddleton	30	2.38	
Hardison's Mills	5	2.00	
Warner	28, 29	2.10	
Ashwood	28, 29	2.00	
Hohenwald	29	2.53	
Sailors Rest	27, 28	2.18	
Bolivar	28, 29	2.68	
Texas.			
Galveston	3, 4	8.24	26.01
Do	15 to 20	10.53	
Indianola	3, 4	2.89	10.36
Do	18, 19, 20	5.07	
Hearne	10	2.41	9.16
Do	17	4.50	
Sour Lake	7	2.00	9.11
Do	18, 19	2.81	
Do	30	2.00	
Columbia	3, 4	3.07	9.06
Do	19	3.04	
Austin	9	2.00	8.97
Do	16, 17	5.48	
Waco	9, 10	2.05	6.85
Do	15, 16	3.50	
Paris	16, 17	3.14	
Comfort	9, 10	2.20	
Rio Grande City	15, 16	2.74	
Vermont.			
Charlotte	10	2.50	
Virginia.			
Norfolk	21, 22	3.05	
Washington T.			
Neah Bay	8, 9	2.65	12.15
Do	14, 15	3.05	
Tatoosh Island			9.60
Pysht	13, 14	3.61	9.44

SNOW.

Snow fell in the various states and territories, as follows:

California.—Fort Bidwell: on the 25th snow fell to a depth of one inch in mountains north and west of station, at an altitude of 2,000 feet.

Red Bluff: the mountains east of this station were covered with snow on the 24th.

Colorado.—Fort Lewis, 5th, 26th; Pike's Peak, 7th, 16th, 26th, 27th.

Montrose: the mountains to the south of this place were covered with snow on the morning of the 7th.

Connecticut.—North Colebrook, 24th.

Dakota.—Deadwood, 4th.

Massachusetts.—Heath and Princeton, 23d.

Montana.—Fort Maginnis, 4th.

New Hampshire.—Mount Washington, 2d, 5th, 23d, 24th.

New York.—Humphrey, Lowville, Houseville, Plattsburg Barracks, New Bremen, Sharon Springs, and Balston, 23d.

Pennsylvania.—Wellsborough, 4th, 23d.

Vermont.—Bennington, Newport, Lunenburg, Dorset, Derby Line, Post Mills, and Strafford, 23d.

Charlotte: snow fell on the mountains east and west of station on the 24th. This is the first snowfall ever known to have occurred at this place in September.

At Strafford the snowfall of the 23d remained on the ground for two days, causing damage to corn and fruit.

At Stowe the snowfall of the 23d drifted to a depth of three feet in many places; it was the earliest snowfall known for many years.

Wyoming.—Fort Bridger, 11th, 12th.

SLEET.

Pike's Peak, Colorado, 1st, 2d, 4th, 5th, 11th, 12th, 18th, 24th, 26th, 30th.

Mount Washington, New Hampshire, 2d.

Blooming Grove, Pennsylvania, 23d.

COTTON REGION REPORTS.

The following table shows the means of the maximum and minimum temperatures, and the average rainfall for the several cotton districts, for the month of September, 1885, together with the averages for the three preceding years:

Temperature and rainfall data for the cotton districts, September, 1885.

Districts.	Rainfall.			Temperature.							
				Maximum.			Minimum.			Extremes for Sept., 1885.	
	Average for Sept. of three preceding years.	Average for Sept., 1885.	Departures.	Mean for Sept. of three preceding years.	Mean for Sept., 1885.	Departures.	Mean for Sept. of three preceding years.	Mean for Sept., 1885.	Departures.	Max.	Min.
	Inch.	*Inch.*	*Inches.*	°	°	°	°	°	°	°	°
New Orleans	3.18	5.09	+ 2.91	88.6	85.0	— 3.6	65.8	67.7	+ 1.9	97	50
Savannah	3.13	7.49	+ 4.36	87.3	83.4	— 3.9	60.2	63.8	+ 3.6	98	53
Charleston	4.88	3.76	— 1.12	84.9	82.9	— 2.0	64.0	66.0	+ 2.0	95	43
Atlanta	1.80	6.68	+ 4.88	84.4	80.8	— 3.6	62.4	63 6	+ 1.2	94	44
Wilmington	5.39	2.99	— 2.40	82.4	81.3	— 1.1	62.0	60.5	— 1.5	94	29
Memphis	1.60	4.24	+ 2.64	85.4	82.9	— 2.5	60.3	61.8	+ 1.5	97	38
Galveston	3.04	5.26	+ 2.26	87.8	87.4	— 0.4	65.0	67.3	+ 2.3	100	38
Vicksburg	1.80	8.43	+ 6.63	88.3	84.4	— 3.9	63 4	66.1	+ 2.7	93	46
Montgomery	1.37	4.19	+ 2.82	86.9	83.5	— 3.4	62.9	64.9	+ 2.0	97	38
Augusta	2.76	4.09	+ 1.33	85.5	82.6	— 2.9	64.0	68.7	+ 4.7	96	47
Little Rock	1.97	1.91	— 0.06	86.5	84.9	— 1.6	58.5	62.2	+ 3.7	100	37
Mobile	0.83	5.49	+ 4.66	89.3	85.6	— 3.7	63.9	68.1	+ 4.2	98	46

The rainfall, as will be seen from the above table, was excessive in all districts, with the exception of those of Charleston and Little Rock, where, in the former, it was deficient, and in the latter, about normal. In the districts of Atlanta, Mobile, Savannah, and Vicksburg, the excess amounted to more than four inches.

While the means of the maximum temperatures were in all districts lower than the average, the minimum temperatures are, in all districts, except that of Wilmington, higher than the average.

TEMPERATURE OF WATER.

The following table shows the highest and lowest temperatures of water observed at the several stations; the monthly ranges of water temperature; the average depth at which the observations were made; and the mean temperature of the air:

Temperature of water for September, 1885.

Station.	Temperature at bottom.		Range.	Average depth, feet and tenths.	Mean temperature of the air at station.
	Min.	Max.			
	°	°	°		°
Atlantic City, New Jersey	74.1	64.0	10.1	9.1	64.7
Alpena, Michigan	60.5	53.8	6.7	12.8	55.4
Augusta, Georgia	84.1	69.3	14.8	7.8	73.8
Baltimore, Maryland	77.0	68.5	8.5	10.3	66.9
Block Island, Rhode Island	64.7	56.1	8.6	7.6	61.4
Boston, Massachusetts	62.2	55.1	7.1	19.2	59.6
Buffalo, New York	67.3	57.6	9.7	9.5	60.0
Canby, Fort, Washington Territory	61.9	59.1	2.8	16.7	58.5
Cedar Keys, Florida	88.2	79.1	9.1	8.7	79.9
Charleston, South Carolina	80.8	74.3	6.5	17.5	76.4
Chicago, Illinois	77.8	57.6	20.2	8.8	63.9
Chincoteague, Virginia	77.6	67.2	10.4	3.7	67.3
Cleveland, Ohio	68.9	61.9	7.0	14.0	61.5
Detroit, Michigan	65.8	60.0	5.8	26.3	62.7
Duluth, Minnesota	58.7	47.3	11.4	10.5	53.9
Eastport, Maine	51.8	50.0	1.8	16.8	54.4
Escanaba, Michigan	60.3	54.0	6.3	18.3	55.3
Galveston, Texas	86.8	76.6	10.2	13.2	79.9
Grand Haven, Michigan	67.6	60.9	6.7	19.0	59.6
Indianola, Texas	85.9	77.0	8.9	9.2	79.5
Jacksonville, Florida	88.0	77.8	10.2	18.0	78.3
Key West, Florida	89.9	84.2	5.7	17.6	84.0
Mackinaw City, Michigan	59.0	53.8	5.2	10.0	55.6
Macon, Fort, North Carolina	82.0	72.6	9.4	13.4	72.6
Marquette, Michigan *	54.7	52.9	1.8	12.4	55.5
Milwaukee, Wisconsin	61.7	56.7	5.0	8.0	60.0
Mobile, Alabama	83.8	77.5	6.3	16.0	76.6
New Haven, Connecticut	69.7	61.5	8.2	16.9	60.7
New London, Connecticut	67.2	61.2	6.0	11.6	61.0
New York City	77.0	63.2	13.8	18.3	64.1
Norfolk, Virginia	77.0	67.1	9.9	16.2	70.0
Pensacola, Florida	85.0	78.4	6.6	17.4	78.3
Portland, Maine	57.7	52.3	5.4	16.7	57.0
Portland, Oregon	67.7	62.9	4.8	49.5	62.2
Sandusky, Ohio	70.0	61.8	8.2	11.7	63.4
Sandy Hook, New Jersey	74.1	67.7	6.4	2.3	64.7
San Francisco, California	61.1	58.1	3.0	37.7	60.7
Savannah, Georgia	81.8	71.6	10.2	11.2	76.0
Smithville, North Carolina	79.5	70.3	9.2	11.1	74.0
Toledo, Ohio	68.4	63.2	5.2	13.7	63.0
Wilmington, North Carolina	84.2	67.2	17.0	14.8	73.1

* Record for last four days of the month.

WINDS.

The most frequent directions of the wind during September, 1885, at Signal Service stations, are shown on chart ii by arrows flying with the wind; they are also given in the table of miscellaneous meteorological data. In New England, the Lake region, upper Mississippi, Missouri, and Ohio valleys, the prevailing directions were mostly southerly; on the middle and south Atlantic coasts and in the Gulf States, they were mostly northeasterly; on the Pacific coast, they were generally from the west; in the Rocky Mountain districts they were variable.

HIGH WINDS.

[*In miles per hour.*]

On the summit of Mount Washington, New Hampshire, wind-velocities of fifty or more miles per hour occurred on the following dates: 1st to 6th, 8th, 9th, 13th to 19th, 22d, 23d, 24th, the highest velocities being 90, nw., 23d (maximum for month); 85, w., 4th; 80, nw., 16th.

Other stations registering wind-velocities of fifty miles or more per hour are as follows:

Dodge City, Kansas, 51, nw., 7th.
Fort Assinaboine, Montana, 51, sw., 9th.
Valentine, Nebraska, 54, n., 11th.
Fort Shaw, Montana, 68, sw., 13th.
Pike's Peak, Colorado, 52, nw., 13th.
Indianola, Texas, 60, ne., 19th.
Fort Macon, North Carolina, 52, se., 21st.
Kitty Hawk, North Carolina, 56, n., 22d.
Sandy Hook, New Jersey, 53, nw., 23d.
Cape Henry, Virginia, 51, nw., 23d.
Cape May, New Jersey, 56, nw., 23d.

LOCAL STORMS AND TORNADOES.

Dodge City, Kansas: a violent northwesterly gale occurred at this place at about 6 p. m. on the 7th. The wind, for a few minutes, blew at the rate of sixty miles per hour.

Maybee, Monroe county, Michigan: at 5.45 p. m. on the 8th a violent storm occurred at this place, destroying several buildings.

Cambridge City, Wayne county, Indiana: at about 5.30 p. m. on the 8th this place was visited by a destructive storm. Several dwellings and out-buildings in this vicinity were unroofed or otherwise damaged.

Lancaster, Fairfield county, Ohio: numerous dwellings were destroyed in this county by a violent storm on the 8th. Orchards and crops were also destroyed, and considerable stock killed.

Napoleon, Henry county, Ohio: at about 5 p. m. on the 8th a severe wind storm prevailed in this vicinity. Several dwellings and barns in the surrounding country were blown down. The track of the storm was about one-half mile in width; it appears to have spent its violence north of this place.

Portsmouth, Scioto county, Ohio: at 4.50 p. m. on the 8th a tornado passed, in a northerly direction, over this place, unroofing a few buildings and blowing down many chimneys, trees, etc., its path being about two hundred yards in width. The tornado approached the city from the south, coming over a hill about six hundred feet in height on the opposite side of the river. It was of only a few seconds' duration, and was accompanied by a roaring sound. A revolving motion of the cloud, from east to west, was observed during its passage. The observer states that the hill mentioned probably afforded the city great protection from the violence of the tornado.

Garrettsville, Portage county, Ohio: a violent storm occurred three miles southeast of station on the 8th. Much damage was done to orchards, forests, and farm buildings.

Jacksonborough, Butler county, Ohio: the storm of the 8th caused considerable damage; buildings were unroofed, and the tobacco in many places was totally destroyed.

Circleville, Pickaway county, Ohio: during the night of the 8–9th a destructive storm passed through this county from the western to the northeastern boundary. Its path was about one hundred yards wide; it was not continuous, and in places no evidences of the storm are apparent. A number of dwellings and out-buildings were demolished.

Urbana, Champaign county, Ohio: a severe wind and rain

storm passed through the southern and eastern portions of this county during the night of the 8–9th. At Terre Haute, and in that vicinity, the smaller out-buildings, and nearly all fencing, were destroyed, and the growing crops badly damaged.

Bucyrus, Crawford county, Ohio: a destructive tornado occurred in this vicinity during the night of the 8–9th. Its course was in a northeasterly direction, and dwellings, barns, orchards, etc., in its path were destroyed. The damage in this county is estimated at $50,000. At Galion and Osceola the storm was especially severe.

Caldwell, Noble county, Ohio: a violent wind and rain storm occurred at this place during the night of the 8-9th, causing great damage to the corn crop, orchards, and shade trees.

Washington Court House, Fayette county, Ohio: at about 8 p. m. on the 8th this place was almost totally destroyed by a tornado. Of forty business establishments fronting Central square, not one escaped destruction; besides these, about two hundred residences were demolished. Six persons were killed, and more than one hundred were more or less seriously injured. Washington Court House is the county seat of Fayette county. Being the centre of a rich agricultural district, with excellent railroad facilities, it has, during the last fifteen years, grown to be a business place of considerable importance. Its residents had beautified the town with tasteful dwellings, and its recently completed court house was one of the best in the state. The damage caused by the tornado is variously estimated, but it is generally considered that it will be about $500,000.

Chambersburg, Franklin county, Pennsylvania: a severe storm passed over this place on the 9th. At Mount Alto, ten miles east, trees were uprooted or twisted off. The storm seems to have spent its force in the vicinity of Mount Alto.

Kansas City, Missouri: reports from Rich Hill, Bates county, state that a severe storm prevailed at that place during the night of the 8–9th, causing damage estimated at several thousand dollars. A brick dwelling was partly demolished and numerous out-buildings were destroyed.

Fort Reno, Indian Territory: at 1.10 a. m. on the 13th a dark, cone-shaped tornado-cloud was observed approaching this place from the northwest, the smaller end being downward and apparently within seventy-five feet of the earth. When within one mile of the station the course of the cloud changed to the eastward and it passed within one-half mile of the post. The cloud did not descend to the ground; it was preceded and accompanied by a loud, roaring sound.

Lead Hill, Boone county, Arkansas: reports from Mountain Home, Baxter county, state that during the morning of the 13th a violent storm occurred at that place. Trees were uprooted, houses unroofed, and roadways obstructed. A severe storm is also reported to have occurred on the above date at Vanndale, Cross county, causing considerable damage.

Astoria, Oregon: at about 3 p. m. on the 15th a whirlwind passed in a westerly direction near this place, twisting off small trees and carrying them into the air. At Skipanon, a few miles west of Astoria, the whirlwind left quite a marked path through the small timber. In Upper Astoria a man was injured by the falling timbers of a house which was blown down.

The following are reports of tornadoes which occurred during September, 1885, forwarded by special tornado observers, of whom there are more than 1,400.

Tippecanoe City, Miami county, Ohio: at 7 p. m., local time, on the 8th a tornado passed north of this place to a point seven miles north of Springfield, Clarke county. In its path three dwellings, a school-house, four barns, and other out-buildings were destroyed; one person was killed and five injured.

Hiram, Portage county, Ohio: at 10.15 p. m. on the 8th a tornado occurred at a point about eight miles southeast of this place. The cloud was funnel-shaped and moved in a north-northeasterly direction, its path being one and one-fourth miles long and three hundred and thirty feet in width.

Upper Sandusky, Wyandot county, Ohio: a tornado occurred here at about 7 p. m. on the 8th. The cloud was funnel-shaped and moved in a northeasterly direction, its path being 1,320 feet in width. A large church, a residence (both brick structures), and a barn were destroyed.

Washington Court House, Fayette county, Ohio: at 7.30 p. m., local time, on the 8th a violent and destructive tornado occurred at this place. The tornado-cloud moved in an east-northeasterly direction, its path being about two hundred and fifty feet in width. It was about ten seconds in passing a given point. Three hundred buildings were destroyed, or badly injured. These included many business houses, four railroad depots, three churches, and the gas-works. The losses sustained are estimated at $500,000. About one hundred persons were injured and six killed. (See report above.)

At 5 p. m., standard time, on the 8th a tornado passed from a point in the northeastern part of Hillsdale county, Michigan, to Ridgeway, Lenawee county, a distance of thirty miles, its path being from two hundred to six hundred and sixty feet in width. About fifteen buildings were destroyed, three persons injured, and much stock killed. The damage is estimated at $30,000.

Komstad, Clay county, Dakota: a tornado occurred at this place at 8 p. m. on the 11th. There were two funnel-shaped clouds which moved in an east-southeasterly direction. Numerous out-buildings were destroyed and five persons injured.

Ord, Valley county, Nebraska: a tornado occurred at this place at 10.15 p. m. on the 11th. Its course was north-northwesterly for a distance of ten miles, the path being about six hundred and sixty feet in width. Numerous buildings were destroyed and two persons killed.

Yankton, Dakota: a tornado occurred near this place on the 11th. It moved in an easterly direction for a distance of ten miles, causing no damage, as the tornado-cloud did not extend to the earth.

Captain Samuel Hess, commanding the s. s. "Philadelphia," furnishes the following description of a tornado which occurred September 4th at Puerto Cabello, State of Carabobo, Venezuela:

September 4th, 4.32 p. m. (Greenwich mean time): A tornado, or, as the natives term it, a "caldaretta," beginning at south and ending at west, occurred at the above time; it lasted one hour, and the barometer fell during the storm 0.10 inch; terrific thunder and lightning, accompanied by heavy rain. Some slight damage was done to the vessels in port by breaking adrift from their moorings. One seaman, belonging to one of the small traders, was killed by lightning. The palm trees in the park at the entrance of the port were stripped of their foliage, and many were torn up by the roots. The path of the storm was about three hundred yards wide. The difference between the wet and dry-bulb thermometers was 1°.5.

NAVIGATION.

FLOODS.

Rio Grande City, Texas: the Rio Grande River rose rapidly on the 2d and overflowed during the night.

Leavenworth, Kansas, 7th: it has rained almost daily during the past week, the aggregate precipitation amounting to about 6.50 inches. All streams are much swollen, and many fields of low land are flooded.

Parsons, Labette county, Kansas: a very heavy rainfall occurred here during the night of the 7-8th. The creeks in this vicinity overflowed and the lowlands were flooded. This town was entirely surrounded by water, and many people living in the suburbs near Labette Creek were compelled to move out of their dwellings.

Escanaba, Michigan: the heavy rains of the 8th caused washouts on the Chicago and Northwestern railroad near Fort Howard, Wisconsin. Between that place and Duck Creek the water covered the track to a depth of four feet.

Lamar, Missouri: a remarkably heavy rainfall occurred at this place on the 8th. During the eight hours ending at 3 p. m. the rainfall amounted to more than six inches. Creeks and streams overflowed, and the crops in the surrounding country were much damaged.

Milwaukee, Wisconsin: the heavy rains of the 8th and 9th,

with the high water in the lake, flooded cellars, etc., causing considerable damage.

Tucson, Arizona: a freshet occurred at Pantano on the 9th. The railroad track was covered to a depth of several feet, and damaged.

Jackson, Hinds county, Mississippi: the rainfall of the 10th was remarkably heavy and caused considerable damage to the Yazoo railroad. Several bridges were washed away.

Galveston, Texas: the unprecedented rainfall at this place from the 15th to the 20th flooded a large part of the city. In many places the water covered the streets to a depth of more than one foot.

Vicksburg, Mississippi, 22d: the continuous rains in this section have caused great damage to the cotton crop. It is estimated that fully forty per cent. of the cotton in this section has been ruined.

Manatee, Manatee county, Florida: the very heavy rains on the 24th, 25th, and 26th washed away bridges and caused much damage to the roads in this part of the state.

Jacksonville, Florida: during the night of the 26–27th more than six inches of rain fell at this place. Dwellings and stores were flooded and railroads damaged.

Savannah, Georgia, 30th: no mails from Florida have been received during the last three days in consequence of washouts on the railroads. Reports from Brunswick, Georgia, state that twenty-five miles of the Brunswick and Western railroad, between Brunswick and Waynesville, have been washed away. From the 27th to 30th the rainfall at Savannah amounted to 5.50 inches. The damage to the rice crop in both Georgia and South Carolina has been very great. Many of the rice fields along the Savannah River have been covered with water.

STAGE OF WATER IN RIVERS.

In the following table are shown the danger-points at the various river stations; the highest and lowest stages for September, 1885, with the dates of occurrence, and the monthly ranges:

Heights of rivers above low-water mark, September, 1885.

[*Expressed in feet and tenths.*]

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
Red River:						
Shreveport, Louisiana	29 9	11	4 2	4, 5	3 0	1 2
Arkansas River:						
Fort Smith, Arkansas	22 0	13	17 5	4, 28	4 0	13 5
Little Rock, Arkansas	23 0	15	17 1	7	4 8	12 3
Missouri River:						
Yankton, Dakota	24 0	2,12,13, 14	15 9	30	14 0	1 9
Omaha, Nebraska	18 0	3	8 4	30	6 6	1 8
Leavenworth, Kansas	20 0	1	10 2	30	7 2	3 0
Mississippi River:						
Saint Paul, Minnesota	14 5	6 to 19	3 9	6	2 9	1 0
La Crosse, Wisconsin	24 0	20, 21	6 2	7	4 0	2 2
Dubuque, Iowa	16 0	23, 24	6 7	7	4 5	2 2
Davenport, Iowa	15 0	15,16,17	5 9	7	3 9	2 0
Keokuk, Iowa	14 0	1	9 6	8	5 5	4 1
Saint Louis, Missouri	32 0	15	22 2	29, 30	13 0	9 2
Cairo, Illinois	40 0	17	21 4	30	13 8	7 6
Memphis, Tennessee	34 0	19, 20	15 0	1	9 2	5 8
Vicksburg, Mississippi	41 0	24, 25	21 9	4	12 0	9 9
New Orleans, Louisiana*	—3 0	26	— 9 4	11	—12 3	2 9
Ohio River:						
Pittsburg, Pennsylvania	22 0	11	6 5	30	1 6	4 9
Cincinnati, Ohio	50 0	1	19 2	29, 30	5 3	13 9
Louisville, Kentucky	25 0	2	8 2	28, 29	3 6	4 6
Cumberland River:						
Nashville, Tennessee	40 0	30	1 4	13, 19	0 4	1 0
Tennessee River:						
Chattanooga, Tennessee	33 0	22,23,24	2 2	20	0 7	1 5
Monongahela River:						
Pittsburg, Pennsylvania	29 0	11	6 5	30	1 6	4 9
Savannah River:						
Augusta, Georgia	32 0	22	21 6	19	4 7	16 9
Mobile River:						
Mobile, Alabama	.....	9	16 5	30	15 5	1 0
Sacramento River:						
Red Bluff, California	.....	24	1 0	1 to 23	0 4	0 6
Sacramento, California	.....	28	8 0	1 to 26	7 3	0 7
Willamette River:						
Portland, Oregon	.....	10,12,13	4 4	19	2 4	2 0
Colorado River:						
Yuma, Arizona	.....	.....	.....	.....	.....	.....

* Below high-water mark of 1874 and 1883.

The observer at Chattanooga, Tennessee, reports that on the 13th the river reached a stage sufficient to permit the running of small boats, navigation having been suspended since August 25th. The lowest stage of the season occurred on the 20th.

HIGH TIDES.

Cedar Keys, Florida, 21st.
New River, Inlet, North Carolina, 10th, 11th, 27th, 28th.
Indianola, Texas, 18th.

LOW TIDE.

The following is an extract from the "New York Herald" of September 8, 1885:

QUEBEC, *September* 7, 1885.—The steamers Carmona, Brooklyn and Polynesian, on their way down from Montreal, scraped ground several times, the two former vessels drawing twenty-five feet two inches, and the latter a few inches less.

The steamer Grecian, which grounded at Champlain, had to be lightened in order to get off. The Gulf lighthouse keepers report that the tides have of late run from four to five feet lower than has been known for the last fifty years.

VERIFICATIONS.

The percentages of verifications of special predictions for certain localities are, as follows:

Milwaukee, Wisconsin, 82.08; Auburn, Alabama, 79.17; Jacksonville, Florida (four days), 87.50; Omaha, Nebraska, 83.17; Arkansas, 84.62; Georgia, 87.50; Tennessee, 88.46; Dallas, Texas, 92.79 (as verified by observer, 92); Rochester and Oswego, New York, 80.00; Portland, Maine, 80.83; Chambersburg and York, Pennsylvania, 94.58; Richmond, Virginia, 89.17; Meadville, Pennsylvania, 85.00 (as verified by observer, 98); Oil City, Pennsylvania, 89.17 (as verified by observer, 100); Columbus, Ohio, 78.75; Bucyrus and northern Ohio, 80.00; Albany, New York, 91.25 (as verified by observer, 88); Cincinnati, Ohio, 76.67; Buffalo, New York, 75.83; Indianapolis, Indiana, 77.50; Chicago, Illinois, 78.33; Saint Louis, Missouri, 82.08; Cairo, Illinois, 83.75; Boston, Massachusetts, and New Haven, Connecticut, 90.00; (New Haven, Connecticut, as verified by observer, 88); Louisville, Kentucky, 75.83; Detroit, Michigan, 77.08; Kansas, Indian Territory, and western Missouri, 79.17; central Illinois and western Indiana, 83.75; northwestern Ohio and eastern Indiana, 82.50; Toledo, Ohio, 78.75; Memphis, Tennessee, 80.17; Shreveport, Louisiana, 81.03 (as verified by observer, 73); Cumberland, Maryland, 91.81; Hagerstown, Maryland, 90.09 (as verified by observer, 82); Lawrenceburg, Indiana, 83.19 (as verified by observer, for nineteen days, 91); Wheeling, West Virginia, 85.77 (as verified by observer, for twenty days, 87); Blanchester, Ohio, 82.33 (as verified by observer, 98); Portsmouth, Ohio, 81.90 (as verified by observer, 86); Parkersburg, West Virginia, 85.27 (as verified by observer, 83); Defiance, Ohio, 86.50 (as verified by observer, 94); District of Columbia and Baltimore, Maryland, 93.27; Cleveland, Ohio (twenty days), 79.38; Erie, Pennsylvania (twenty days), 84.38; Garrett, Indiana (nineteen days), 85.53 (as verified by observer, 100); Sandusky, Ohio (fifteen days), 83.33; Pittsburg, Pennsylvania (thirteen days), 88.46; Olney, Illinois (nine days), 95.53 (as verified by observer, 100); Mansfield, Ohio (nine days), 83.33; Connellsville, Pennsylvania (nine days), 93.06; Vincennes, Indiana (eight days), 96.88; Chillicothe, Ohio (seven days), 83.93; Somerset, Pennsylvania (three days), 75.00; Uniontown, Pennsylvania (one day), 75.00; Springfield, Missouri (one day), 100.00; New York City and Philadelphia, Pennsylvania, 93.75; (New York City, as verified by observer, for twenty-six days, 98); Colorado, 69.58; Eastman, Georgia (as verified by observer), 88; Bloomington, Illinois (as verified by observer), 89; Jessup, Georgia (as verified by observer), 100.

CAUTIONARY SIGNALS.

During September, 1885, one hundred and forty three cautionary signals were ordered. Of these, one hundred and six, or 74.13 per cent., were justified by winds of twenty-five miles or more per hour, at or within one hundred miles of the station. Thirty-four cautionary off-shore signals were ordered, of which

number, twenty-three, or 67.65 per cent., were fully justified both as to direction and velocity; twenty-six, or 76.47 per cent., were justified as to direction, and twenty-two, or 64.71 per cent., were justified as to velocity. One hundred and seventy-seven signals of all kinds were ordered, one hundred and twenty-nine, or 72.88 per cent., being fully justified. These do not include signals ordered at display stations where the velocity of the wind is only estimated. Of the above cautionary off-shore signals, eighteen were changed from cautionary signals. Three signals were ordered late. In sixty-nine cases winds of twenty-five miles or more per hour were reported for which no signals were ordered.

RAILWAY WEATHER SIGNALS.

Prof. P. H. Mell, jr., director of the "Alabama Weather Service," in the report for September, 1885, states:

The verification of predictions for the whole area was 80 per cent. for temperature and 86 per cent. for weather.

The following roads comprise this system: Western, of Alabama; South & North; Montgomery & Mobile; Mobile & Girard; Georgia Pacific; East Tennessee, Virginia & Georgia system in Alabama; Memphis & Charleston; Columbus Western; Atlanta and West Point, of Georgia; Northeastern, of Georgia; Atlanta & Charlotte Air Line; Western & Atlantic; Georgia; East Tennessee, Virginia & Georgia system in Georgia; and Savannah, Florida & Western.

ATMOSPHERIC ELECTRICITY.

AURORAS.

Fort Totten, Dakota, 1st: an aurora was observed from 9 p. m., continuing till 2.10 a. m. of the 2d.

Eastport, Maine, 2d: an auroral light of whitish color was observed from 8 until 11 p. m.

Fort Buford, Dakota, 3d: an auroral arch of whitish color, extending from northwest to northeast and to an altitude of 40°, was observed from 10.20 p. m. until about midnight. A dark segment extended to about 20° above the horizon, and from it streamers of straw color rose upward to, or a few degrees above, the arch,

Fort Totten, Dakota, 3d: an aurora was visible from 10.30 p. m. until daylight of the 4th.

Saint Vincent, Minnesota, 3d: a fine auroral display began at 10.15 p. m. and continued until early morning of the 4th. It consisted of two arches, the upper being but poorly defined. Bright waves of light flashed across the lower arch from east to west.

Alpena, Michigan, 3d: an aurora appeared at 10 p. m., consisting of a diffuse light in the northwestern sky.

Eastport, Maine, 3d: an auroral arch was observed from 7.15 p. m. until 1 a. m. of the 4th.

Manistique, Michigan, 3d: a diffuse auroral light, of moderate brilliancy, was observed from 9 p. m. until midnight; the light extended to an altitude of 40°.

Duluth, Minnesota, 4th: an aurora was visible from 7.30 to 11.30 p. m.

Cresco, Iowa, 4th: an aurora was observed from 8.30 to 10.15 p. m. in the northeastern sky; well-defined beams were observed from 8.45 to 9.

Marquette, Michigan, 4th: an aurora was observed at 10 p. m., consisting of an irregular arch covering 130° of the horizon and extending to an altitude of 40°. The display continued until after midnight.

Alpena, Michigan, 4th: an auroral light was observed at 9.40 p. m.; at 10.08 unusually brilliant streamers appeared in the west. The display was obscured by clouds at 11.45 p. m.

Grand Haven, Michigan, 4th: a faint aurora was observed through the broken clouds from 9.20 to 11.15 p. m.

Bismarck, Dakota, 4th: an aurora appeared at 9.50 and continued until 11.50 p. m. It was quite brilliant at the beginning of the display, when flashes of light were observed.

Saint Vincent, Minnesota, 4th: an aurora was observed at 9.20 p. m. When first noticed it consisted of pale, slender streamers, reaching an altitude of 30°. At 10.15 a well-defined arch appeared, from which streamers extended to the zenith. The aurora continued until 3 a. m. on the 5th, when it was obscured by clouds.

Moorhead, Minnesota, 4th: a faint aurora appeared at 9 p. m.; it assumed the form of an arch at 10.15, and several streamers appeared, extending upward 60°; the display ended at 11 p. m.

Fort Totten, Dakota, 4th: an auroral light was visible at dusk; three arches, 5°, 15°, and 40° altitude, respectively, with occasional shooting beams, were observed; the display ended at 8.40 p. m.

Fort Yates, Dakota, 4th: an aurora was visible from 10.15 to 10.20 p. m., covering 60° of the horizon and extending to an altitude of 10°.

Saint Paul, Minnesota, 4th: an auroral display was visible from 9.45 to 11.45 p. m., consisting at first of a deep yellowish glow, changing at 10 p. m. to a double arch, with broad streamers reaching from 20° to 40° above the horizon. At 11.45 all traces of the aurora had disappeared.

Fort Bennett, Dakota, 4th: at 12.15 a. m. an aurora, which was probably obscured during its greatest brilliancy, was observed in the form of a partial arch, covering 45° of the horizon and extending to an altitude of 20°; no streamers were seen.

Fort Sully, Dakota, 4th: a faint auroral arch was observed from 10.45 to 11.50 p. m.

Poplar River, Montana, 4th: an aurora, resembling morning dawn, appeared at 10.25 p. m. and remained visible until 4.30 a. m. of the 5th.

Fort Totten, Dakota, 14th: an auroral arch of 20° altitude was observed in the north from 9.30 p. m. until 3 a. m. of the 15th.

Alpena, Michigan, 14th: an aurora appeared at 10 p. m. and continued till 11.58.

Mount Washington, New Hampshire, 14th: a diffuse auroral light, having an altitude of 12° and extending over 80° of the horizon, was observed from 11.11 to 11.26 p. m.

Eastport, Maine, 14th: a faint auroral light was observed at 7 p. m. The display continued till 1 a. m. of the 15th.

Huron, Dakota, 15th: an aurora appeared in the northeast and north soon after midnight. At times bright beams rose almost to the zenith from an arch which extended along the horizon.

Valentine, Nebraska, 15th: an aurora was visible in the north-northeastern sky, with faint streamers extending upward 25°. The display was observed from 10.45 to 11.30 p. m.

Fort Benton, Montana, 15th: a brilliant aurora was observed through breaks in clouds during the evening.

Yankton, Dakota, 15th: very faint aurora, in the form of an arch with long streamers, was observed at 10.15 p. m.; at 11.10 streamers were shorter but more numerous.

La Crosse, Wisconsin, 15th: an aurora was observed from 9 p. m. until 2 a. m. of the 16th. At 9.50 a perfect arch was formed, with a few streamers reaching an altitude of 40°; at 10.30 a double arch extended along the horizon, the upper arch being indistinct; after midnight only a diffuse light remained.

Saint Paul, Minnesota, 15th: an auroral light was observed in the north at 9.35 p m.; at 9.50 an arch formed; a few beams appeared between 10 and 10.15 p. m.; at 10.25 a band of light rose from the western horizon and extended across the sky, forming a complete arch which remained visible until 11.15 p. m. The aurora disappeared at 1.30 a. m. of the 16th. During the display telegraphic communication was interfered with to some extent.

Keokuk, Iowa, 15th: at 8.45 p. m. an auroral arch of pale yellow, covering 50° of the horizon, was observed; the display continued until 10.50 p. m.

Fort Yates, Dakota, 15th: a bright auroral display was observed from 9.30 to 11.55 p. m. A bright band of light, 1° in width, extended across the sky from east to west at 11.10.

Fort Buford, Dakota, 15th: a brilliant display of the aurora was observed from 9.54 to 11.30 p. m.; it was most brilliant from 10.38 to 10.40, when bright streamers extended to the zenith.

Fort Totten, Dakota, 15th: a brilliant auroral display was visible from 9.20 p. m. until 12.40 a. m. of the 16th.

Table of miscellaneous meteorological data for September, 1885—Signal Service observations.

Stations.	Elevation above sea-level.	Atmospheric pressure (in inches and hundredths).							Temperature of the air (in degrees Fahrenheit).												Mean rel. humidity.	Mean dew-point.	Precipitation.	Departure from normal.	Winds.				No. of rainy days.	No. of cloudy days.	No. of fair days.	No. of clear days.
		Mean actual barometer.	Departure from normal.	Mean reduced barometer.	Extremes.				Monthly mean.	Departure from normal.	Extremes.				Monthly range.	Daily ranges.									Total movement.	Prevailing direction.	Maximum velocity.					
					Highest barometer	Date.	Lowest barometer	Date.			Max.	Date.	Mean max	Min.	Date.	Mean min.		Greatest.	Date.	Least.	Date.					Miles p. h.	Direction.	Date.				
								Monthly range of barometer.																								
New England.																														
Eastport	61	29.90	—.06	29.97	30.37	26	28.76	23	1.61	54.4	— 1.3	70.7	16	61.6	38.0	24	47.8	32.7	22.8	3	7.9	27	81.6	48.6	3.64	0.00	5,033	s.	40	se.	23	7	4	11	15
Portland	99	29.90	—.03	30.00	30.36	26	29.14	23	1.22	57.0	— 3.9	82.1	14	65.8	38.3	24	47.5	43.8	26.9	18	10.1	29	77.1	49.4	1.37	— 1.60	5,221	s.	25	nw.	2	8	4	9	17
Mount Washington	6,279	23.81	.....	29.96	30.28	26	29.21	23	1.07	37.3	— 3.4	55.0	13	45.0	12.7	24	32.0	42.3	32.7	23	6.2	14	89.2	34.0	5.56	— 3.34	21,265	w.	90	nw.	23	13	0	14	16
Boston	125	29.89	—.04	30.02	30.38	26	29.18	23	1.21	59.6	— 2.8	84.3	14	69.2	38.7	24	51.1	45.6	27.4	9	5.6	28	71.1	49.5	1.70	— 1.37	6,977	w.	37	nw.	23	7	4	12	14
Block Island	37	30.02	—.02	30.04	30.40	26	29.28	22	1.12	61.4	— 3.3	77.7	15	67.3	42.7	23	55.8	35.0	19.1	23	0.1	28	80.5	55.2	1.60	— 1.80	8,819	sw.	37	nw.	23	5	2	12	16
Narragansett Pier	.....	.....	.....	.....	.....	.....	.....	.....	.....	59.5	.....	80.2	15	68.7	36.0	24	50.2	44.2	.....	.....	.....	.....	.....	.....	1.39	— 1.38	.....	.....	.....	.....	.....	9	...	...	...
Point Judith	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Haven	107	29.94	.....	30.04	30.38	2	29.34	22	1.05	60.7	— 3.7	83.0	15	72.0	38.5	24	51.0	44.5	28.5	24	15.2	14	76.0	52.3	0.77	— 3.15	4,292	s.	24	n.	23	5	1	12	17
New London	47	30.02	.00	30.06	30.41	26	29.32	22	1.09	61.0	— 2.4	79.4	15	69.5	39.5	24	52.2	39.9	23.4	12	11.5	2	76.4	53.3	1.44	— 1.94	4,056	sw.	23	s.	9	6	1	10	19
Middle Atlantic States.																														
Albany	83	29.96	—.02	30.04	30.35	26	29.37	22	0.98	60.0	— 3.4	84.2	9	71.8	40.9	24	50.7	43.3	30.7	9	12.7	16	73.6	50.6	2.00	— 1.48	3,945	s.	22	s.	13	8	5	9	16
New York City	164	29.93	—.01	30.06	30.39	26	29.34	23	1.04	64.1	— 1.5	83.8	15	73.4	43.5	24	57.1	40.3	25.5	27	10.4	5	70.5	53.6	0.72	— 2.92	4,127	nw.	37	nw.	23	9	1	12	17
Philadelphia	117	29.96	.00	30.07	30.39	26	29.46	22	0.93	65.2	— 1.6	84.8	15	75.8	44.4	24	57.5	40.4	26.4	27	7.9	22	68.6	53.5	1.17	— 2.30	6,128	sw.	33	nw.	23	9	5	11	14
Atlantic City	13	30.05	—.01	30.05	30.36	26	29.40	22	0.96	64.7	— 2.6	80.6	15	71.6	44.0	24	58.4	36.6	23.1	24	2.7	21	80.1	58.0	1.59	— 1.91	5,781	ne.	28	ne.	10	6	3	17	10
Barnegat City	22	30.05	.00	30.06	30.38	26	29.41	22	0.96	64.8	— 1.9	82.1	15	71.2	43.2	24	58.8	38.9	24.5	24	5.0	11	81.2	58.7	1.38	— 3.67	8,304	e.	44	nw.	23	7	4	11	15
Cape May	27	30.03	.....	30.04	30.33	26	29.40	22	0.93	66.9	— 1.2	83.0	9	73.6	52.1	17	60.2	30.9	23.8	6	6.5	23	76.4	58.8	0.81	— 3.35	9,243	s.	56	nw.	23	5	7	9	14
Little Egg Harbor	.....	.....	.....	.....	.....	.....	.....	.....	66.1	.....	82.2	15	72.5	44.7	24	59.7	37.5	.....	.....	.....	.....	.....	.....	.....	1.43	— 2.25	.....	.....	.....	.....	.....	5	...	...	...
Sandy Hook	28	30.05	.00	30.07	30.40	26	29.42	22	0.98	64.7	— 2.5	85.0	15	73.5	46.5	24	58.5	38.5	21.8	24	8.3	21	83.0	59.1	0.58	— 4.12	9,569	se.	53	nw.	23	5	3	9	18
Cape Henlopen	.....	.....	.....	.....	.....	.....	.....	.....	66.6	.....	91.1	9	74.1	43.5	24	59.1	47.6	.....	.....	.....	.....	.....	.....	.....	1.26	.....	.....	.....	.....	.....	.....	7	...	...	...
Baltimore	45	30.04	.00	30.07	30.36	26	29.51	22	0.86	66.9	— 1.2	85.9	9	75.5	45.7	24	59.2	40.2	25.4	24	5.1	22	67.7	55.0	1.30	— 2.73	3,531	nw.	22	nw.	23	8	4	16	10
Ocean City*	.....	.....	.....	.....	.....	.....	.....	.....	67.0	.....	82.1	5	72.5	43.4	24	61.7	38.7	.....	.....	.....	.....	.....	.....	.....	0.83	.....	.....	.....	.....	.....	.....	3	...	...	...
Washington City	106	29.98	.00	30.08	30.36	26	29.55	22	0.81	66.1	— 1.8	90.7	9	76.1	44.0	24	57.2	46.7	28.7	25	4.8	22	71.2	55.3	2.15	— 1.96	2,924	s.	23	nw.	23	5	7	12	11
Cape Henry	16	30.06	.00	30.06	30.34	26	29.53	22	0.81	70.4	— 1.7	89.4	14	77.8	52.7	25	63.8	36.7	24.2	25	3.7	21	75.3	61.7	2.33	— 2.90	9,326	ne.	51	nw.	23	5	5	10	15
Chincoteague	8	30.07	+.01	30.06	30.35	26	29.48	22	0.87	67.3	— 3.2	82.3	15	72.8	44.1	24	59.0	38.2	21.2	19	7	6	21	76.6	3.13	+ 0.63	5,721	ne	37	n.	22	7	4	8	18
Lynchburg	652	29.40	.00	30.06	30.34	26	29.60	22	0.73	67.4	— 1.4	90.7	9	77.8	46.2	24	58.6	44.5	26.9	24	9.6	22	71.7	56.5	1.38	— 2.08	2,041	s.	23	nw.	23	5	10	11	9
Norfolk	30	30.07	+.02	30.08	30.30	26	29.58	22	0.72	70.0	— 1.6	89.3	9	77.7	51.4	24	63.0	37.9	23.2	14	4.4	21	74.2	60.7	3.31	— 1.56	4,830	ne.	25	ne.	22	4	4	15	11
South Atlantic States.																														
Cape Lookout	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Charlotte	808	29.24	.00	30.05	30.28	18	29.68	22	0.60	69.9	— 1.3	89.1	9	78.4	47.6	24	62.1	41.5	25.1	25	8.2	21	70.5	59.0	3.45	+ 0.22	3,381	ne.	19	e.	21	5	9	13	8
Fort Macon	11	30.06	.00	30.04	30.28	17	29.52	22	0.77	72.6	— 2.4	83.6	16	77.9	57.0	24	68.0	26.6	15.4	8	5.0	15	89.2	69.2	6.31	— 1.17	10,212	ne.	52	se.	21	8	6	14	10
Hatteras	12	30.05	—.02	30.04	30.29	26	29.40	22	0.89	72.1	— 3.2	85.0	15	77.3	57.0	24	67.7	28.0	14.4	14	5.5	2	80.6	65.5	7.27	— 0.05	7,266	ne.	36	nw.	22	6	4	15	11
Kitty Hawk	9	30.07	—.02	30.06	30.33	26	29.43	22	0.90	70.7	— 2.1	91.2	15	76.2	52.4	24	65.7	38.8	19.1	14	3.6	21	81.9	64.6	4.62	— 1.46	8,947	ne.	56	n.	22	3	5	15	10
New River Inlet	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portsmouth	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Scott's Hill	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Smithville	34	30.02	—.02	30.03	30.25	18	29.59	22	0.65	74.0	— 0.6	85.8	16	78.8	48.7	24	66.8	37.1	22.5	24	6.2	20	83.6	68.5	6.94	+ 0.48	7,393	e.	28	se.	21	8	8	13	9
Wash Woods	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wilmington	52	30.00	—.02	30.03	30.26	17	29.58	22	0.68	73.1	— 0.3	89.0	16	81.1	51.6	24	65.8	37.4	22.4	24	6.3	21	80.8	66.5	5.69	— 2.09	4,347	e.	17	ne.	21	6	7	18	5
Charleston	52	29.99	—.02	30.01	30.20	18	29.70	22	0.50	76.4	— 0.3	91.3	9	81.8	63.0	22	71.1	28.3	15.5	9	4.0	30	81.8	70.7	3.32	— 3.45	5,765	e.	76	e.	17	14	11	12	6
Augusta	183	29.87	—.04	30.02	30.24	18	29.74	22	0.49	73.8	— 1.1	95.2	16	84.3	51.8	25	66.6	43.4	30.2	25	5.9	21	78.6	65.6	2.78	— 1.20	3,154	ne.	19	ne.	21	12	12	11	7
Savannah	87	29.94	—.04	30.00	30.18	17	29.73	21	0.45	76.0	+ 0.2	90.3	9	81.4	62.0	24	71.0	28.3	14.7	24	5.0	27	82.1	69.8	12.60	+ 6.76	5,501	e.	27	ne.	29	17	11	13	6
Jacksonville	43	29.93	—.06	29.96	30.10	13	29.73	21	0.37	78.3	+ 0.5	92.5	9	85.8	67.9	23	73.2	24.6	17.5	8	4.6	24	84.6	72.7	19.63	+12.48	3,835	ne.	30	se.	29	20	11	14	5
Florida Peninsula.																														
Cedar Keys	22	29.93	—.09	29.91	30.06	12	29.74	30	0.32	79.9	+ 0.3	91.2	17	85.7	68.5	23	74.7	22.7	15.7	12	4.7	25	84.8	74.6	5.76	+ 0.24	5,063	w.	28	e.	11	12	9	18	3
Key West	20	29.96	—.03	29.93	30.06	3	29.77	30	0.29	84.0	+ 1.2	92.3	6	89.8	72.1	23	79.0	20.2	16.8	22	5.0	29	81.6	77.6	5.23	— 0.63	4,544	e.	33	nw.	22	14	7	18	5
Sanford	125	29.96	.....	29.96	30.09	12	29.74	30	0.35	78.5	+ 0.5	93.8	6	89.4	68.4	24	72.6	25.4	21.7	5	7.8	26	86.9	73.6	10.73	+ 7.10	2,921	ne.	20	se.	12	20	6	16	8
Eastern Gulf States.																														
Atlanta	1,129	28.89	—.04	30.03	30.25	18	29.81	22	0.43	69.5	— 2.1	87.2	15	76.4	53.0	24	63.8	34.2	19.0	24	2.5	30	81.1	62.6	6 51	+ 3.78	7,086	e.	28	e.	27	12	9	13	8
Pensacola	30	29.94	—.07	29.93	30.08	18	29.71	27	0.37	78.3	+ 1.0	89.2	15	84.3	65.3	23	73.4	23.9	18.4	23	3.9	19	82.7	74.2	5.51	— 1.23	4,599	ne.	35	e.	26	15	12	18	0
Mobile	35	29.94	—.07	29.94	30.12	18	29.70	27	0.42	76.6	— 0.2	90.4	15	84.9	59.8	24	70.8	30.6	23.0	24	6.6	26	85.1	71.2	9.25	+ 4.22	4,824	n.	25	ne.	26	16	8	18	4
Montgomery	219	29.77	—.06	29.96	30.17	18	29.73	30	0.44	75.2	— 0.3	90.7	15	83.2	55.0	24	68.2	35.7	25.4	24	5.9	26	83.2	69.1	4.83	+ 2.06	3,612	ne.	22	e.	26	15	11	12	7
Vicksburg	209	29.77	—.07	29.96	30.13	18	29.80	27	0.33	73.9	— 1.1	92.0	15	83.4	53.0	24	67.1	39.0	27.8	2	5.2	27	81.1	66.9	9.28	+ 5.14	3,217	ne.	20	se.	11	17	12	14	4
New Orleans	52	29.90	—.07	29.92	30.07	18	29.69	26	0.38	77.1	— 0.9	92.0	13	85.2	65.8	24	72.1	26	20.8	24	5.4	26	86.4	72.3	13.55	+ 9.25	4,6 5	ne.	28	n.	26	17	10	16	4
Western Gulf States.																														
Shreveport	227	2.175	—.06	29.95	30.13	18	29.83	28	0.30	75.2	+ 0.4	95.2	14	85.5	54.8	24	68.2	40.4	28.7	2	7.0	27	78.2	67.0	6.70	+ 2.49	.....	ne.	.....	.....	...	15	7	13	10
Fort Smith	470	29.50	—.04	29.96	30.20	18	29.73	8	0.46	71.2	— 1.3	90.6	4	83.0	49.1	25	62.3	41.5	34.6	25	10.4	17	75.0	61.7	0.99	— 3.40	3,054	e.	16	n.	29	5	8	11	11
Little Rock	299	29.67	—.06	29.94	30.15	18	29.74	8	0.41	73.5	+ 1.2	90.0	12	83.1	55.6	25	67.0	34.4	27.2	25	7.1	27	79.8	66.2	2.06	— 1.10	3,543	ne.	20	ne.	27	7	8	15	7
Galveston	40	29.93	—.04	29.93	30.05	1	29.82	20	0.22	79.9	+ 0.3	90.7	10	84.3	68.5	26	75.3	22.2	13.6	26	5.4	18	81.8	73.6	26.01	+19.76	8,038	s.	35	n.	30	13	8	11	11
Indianola	26	29.91	—.06	29.90	30.03	1	29.74	19	0.29	79.5	+ 0.2	91.0	9	85.6	69.3	25	71	3	21.7	16.6	29	5.5	19	83.4	73.7	10.36	— 3.61	9,686	s.	60	ne.	19	14	5	14	11
Palestine	533	29.44	—.06	29.96	30.12	18	29.82	11	0.30	74.8	— 1.0	93.3	12	84.8	58.4	28	68.0	34.9	24.4	2	8.8	17	80.8	67.6	4.63	+ 1.88	5,891	ne.	28	sw.	13	11	8	11	11
San Antonio	781	29.14	.....	29.90	30.04	14	29.76	11	0.28	77.0	— 0.6	96.0	13	88.7	58.8	30	69.3	37.2	28.6	30	10.7	15	75.5	67.6	1.51	— 3.54	3,861	n.	16	se.	12	10	5	14	11
Rio Grande Valley.																														
Brownsville	59	29.87	—.05	29.88	29.97	1	29.79	19	0.18	79.3	— 0.4	93.0	13	89.2	68.4	25	74.1	24.6	20.4	25	9.8	20	84.6	73.6	3.55	— 2.30	4,690	s.	22	s.	3	12	9	13	8
Rio Grande City	230	29.73	—.03	29.88	29.98	22	29.75	11	0	24	81.6	0.0	100.0	1	92.0	67.7	24	74.9	32.3	22.7	1	10.0	20	76.8	72.3	5.24	+ 2.18	4,434	se.	19	se.	12	8	4	14	12
Ohio valley & Tennessee.																														
Chattanooga	783	29.23	—.04	30.02	30.24	18	29.80	22	0.44	69.4	— 1.1	87.4	15	77.9	51.3	24	63.0	36.1	22.9	12	3.7	30	81.5	62.8	6.48	+ 2.74	3,508	ne.	19	ne.	16	13	12	13	5
Knoxville	980	29.05	—.04	30.04	30.26	18	29.78	22	0.47	68.9	+ 0.4	88.3	12	79.5	44.7	24	60.6	43.6	33.8	24	7.4	30	72.3	58.5	2.31	— 0.71	3,621	e.	27	w.	8	15	11	11	8
Memphis	321	29.68	—.05	29.99	30.17	18	29.78	30	0.39	72.7	+ 1.3	88.3	3	81.6	51.8	24	66.1	36.5	26.0	24	6.0	27	76.5	64.0	4.42	+ 1.46	3,707	nw.	20	sw.	8	11	8	13	9
Nashville	549	29.45	—.04	30.00	30.22	18	29.76	8	0.45	70.3	— 0.3	88.2	12	80.0	46.2	24	63.0	42.0	30.3	24	6.2	29	74.0	60.8	5.60	+ 2.26	4,049	e.	33	nw.	22	8	11	13	6
Louisville	551	29.48	+.01	30.06	30.26	17	29.66	8	0.60	68.2	— 0.8	86.2	12	77.5	45.2	23	60.3	41.0	28.0	25	5.0	30	73.6	58.5	5.71	+ 2.92	4,220	s.	28	sw.	8	9	9	10	11
Greencastle	897	29.10	.....	30.02	30.26	17	29.54	8	0.72	63.4	.....	80.3	19	71.6	39.2	23	56.5	41.1	27.3	22	3.6	29	75.9	55.0	6.01	.....	3,783	se.	22	sw.	8	10	10	5	15
Indianapolis	766	29.24	—.02	30.02	30.27	17	29.54	8	0.73	63.9	— 2.0	83.8	18	74.8	38.4	23	54.7	45.4	32.3	24	5.5	9	72.9	53.8	3.50	+ 0.88	3,144	s.	21	nw.	22	8	11	7	12
Cincinnati	628	29.40	+.01	30.04	30.26	17	29.60	8	0.66	65.7	— 2.6	84.2	12	75.8	40.9	24	56.9	43.3	33.8	25	6.4	10	71.9	55.2	2.72	+ 0.43	3,776	se.	40	nw.	22	7	8	13	9
Columbus	805	29.21	—.02	30.04	30.28	17	29.62	8	0.66	63.8	— 2.4	82.1	27	74.2	39.1	24	53.7	43.0	34.4	25	9.6	5	75.6	55.0	2.84	+ 0.37	3,905	sw.	27	n.	22	6	6	14	10
Pittsburg	766	29.25	—.02	30.04	30.28	20	29.56	22	0.72	64.6	— 0.3	87.0	26	76.6	43.3	24	54.5	43.7	34.5	26	8.2	10	69.9	53.2	1.69	— 0.90	2,918	s.	25	nw.	22	8	7	10	13
Lower lake region.																														
Buffalo	690	29.31	—.01	30.03	30.32	17	29.53	22	0.79	60.0	— 2.2	82.6	28	68.0	41.0	23	52.3	41.6	25.9	28	4.9	26	78.0	52.7	4.88	+ 1.84	6,869	sw.	41	w.	23	11	6	14	10
Oswego	335	29.66	—.03	30.01	30.31	17	29.48	22	0.83	58.0	— 4.5	79.1	13	66.0	40.1	23	49.8	39.0	31.1	22	7.4	16	73.9	49.1	3.62	+ 1.14	7,004	s.	38	n.	22	9	8	11	11
Rochester	621	29.38	—.01	30.03	30.32	17	29.49	22	0.83	58.9	— 3.2	82.0	28	71.2	40.5	2	50.0	41.5	35.3	21	10.0	16	80.7	52.5	2.49	+ 0.17	6,755	sw.	28	sw.	14	10	6	15	9
Erie	681	29.32	—.02	30.03	30.30	17	29.59	8	0.72	61.4	— 2.7	81.1	13	70.7	43.0	23	53.3	38.1	26.5	22	8.6	18	68.5	50.2	3.42	— 0.90	6,583	w.	35	nw.	1	10	5	12	13
Cleveland	690	29.32	—.02	30.03	30.30	17	29.57	8	0.73	61.5	— 2.2	84.2	28	71.1	43.9	24	54.0	40.3	30.8	25	5.9	10	77.4	53.8	2.01	— 1.89	6,260	se.	30	n.	22	11	7	12	11
Sandusky	639	29.38	.00	30.04	30.30	17	29.53	8	0.77	63.4	— 2.1	84.0	25	72.3	43.0	2	55.0	41.0	32.0	25	7.6	10	68.4	51.9	1.82	— 1.68	7,724	sw.	44	n.	22	6	7	11	12
Toledo	651	29.36	.00	30.03	30.30	17	29.50	8	0.80	63.0	— 1.1	81.9	26	71.5	39.7	23	54.9	42.2	27.0	22	5.1	10	77.8	55.5	2.17	— 0.28	5,179	sw.	27	w.	3	6	4	11	15
Detroit	661	29.34	—.02	30.02	30.30	17	29.51	8	0.79	62.7	0.0	81.3	26	70.8	40.7	23	54.9	40.6	22.5	22	7.7	4	71.4	52.7	1.54	— 1.14	6,354	sw.	29	nw.	22	5	3	15	12
Upper lake region.																														
Alpena	609	29.35	—.02	30.00	30.25	19	29.59	14	0.66	55.4	— 1.6	88.0	26	65.9	37.0	6	47.2	52.6	30.7	22	5.1	8	78.9	48.2	3.76	— 0.90	6,894	w.	32	nw.	22	6	3	16	11
Escanaba	608	29.30	—.03	29.96	30.30	16	29.52	14	0.68	55.3	— 1.2	76.8	22	64.3	30.0	23	46.8	46.8	38.7	22	7.4	12	74.4	46.5	1.69	— 2.70	6,883	sw.	32	n.	22	11	6	16	8
Grand Haven	620	29.35	—.01	30.00	30.22	27	29.49	8	0.73	59.6	— 1.4	79.9	29	67.1	39.1	23	52.3	40.8	23.8	27	6.6	1	75.8	51.5	4.71	+ 0.79	6,813	s.	32	n.	22	9	9	9	11
Mackinaw City	605	29.34	—.05	29.99	30.23	19	29.56	21	0.67	55.6	— 2.2	79.6	26	63.8	38.0	23	49.1	41.6	31.2	22	5.9	30	77.9	48.3	0.69	— 1.49	7,581	nw.	34	e.	9	9	3	18	9
Marquette	672	29.23	—.0	29.96	30.25	19	29.51	12	0.73	55.5	— 1.1	87.1	21	67.0	34.5	23	46.1	52.6	38.4	20	8.5	30	69.2	44.4	1.00	— 4.23	7,027	w.	36	sw.	17	8	6	15	9
Port Huron	633	29.35	—.01	30.02	30.28	17	29.51	8	0.77	59.0	— 2.2	86.1	26	68.4	38.8	2	50.4	47.3	28.9	21	9.2	16

Table of miscellaneous meteorological data for September, 1885—Signal Service observations—Continued.

Stations.	Elevation above sea-level.	Atmospheric pressure (in inches and hundredths).							Temperature of the air (in degrees Fahrenheit).												Precipitation.		Winds.					
		Mean actual barometer.	Departure from normal.	Mean reduced barometer.	Extremes.				Monthly mean.	Departure from normal.	Extremes.					Monthly range.	Daily ranges.			Mean rel. humidity.	Mean dew-point.	Total movement.	Departure from normal.	Prevailing direction.	Maximum velocity.		No. of rainy days.	No. of cloudy days.	No. of fair days.	No. of clear days.
					Highest barometer	Date.	Lowest barometer	Date.			Max.	Date.	Mean max	Min.	Date.	Mean min.		Greatest.	Date.	Least.	Date.				Miles p.hr	Direction.	Date.				
Extreme northwest.																													
Moorhead	923	28.92	—0.4	29.92	30.30	30	29.33	12	0.97	56.6	+ 1.2	92.0	25	71.8	26.0	5	43.5	66.0	40.6	18	15.2	8	69.1	44.5	2.20	— 0.54	7,287	s.	48	s.	10	4	2	14	14
Saint Vincent	804	29.03	—0.4	29.91	30.38	29	29.35	12	1.03	53.1	+ 0.7	82.2	19	68.0	24.0	30	40.2	58.2	40.2	18	13.4	11	79.4	46.2	0.98	— 1.16	5,839	s.	34	w.	14	6	6	10	14
Bismarck	1,694	28.13	—0.2	29.93	30.31	30	29.48	12	0.83	57.1	+ 1.3	95.0	24	71.4	32.4	30	44.4	62.6	47.9	24	11.1	7	62.5	42.1	0.14	— 1.30	4,248	n.	29	n.	25	2	3	11	16
Fort Buford	1,930	27.90	—0.3	29.93	30.30	29	29.46	13	0.84	55.5	+ 1.5	90.5	23	72.0	29.5	4	41.5	61.0	47.2	15	14.5	7	61.1	40.0	0.20	— 0.61	5,266	nw.	32	sw.	13	3	3	22	5
Fort Totten	1,500	28.31	.....	29.91	30.33	29	29.44	12	0.90	54.1	.....	96.0	24	68.1	29.4	4	41.7	66.6	50.7	24	7.3	8	64.1	39.8	0.13	.....	8,603	nw.	40	nw.	14	3	1	16	13
Upper Mississippi Valley.																													
Saint Paul	831	29.07	0.0	29.95	30.24	5	29.36	12	0.88	59.1	+ 0.3	88.2	25	71.6	35.4	6	49.3	52.8	34.2	25	13.0	14	74.6	49.9	3.52	+ 0.17	5,852	se.	27	sw.	12	7	3	16	11
La Crosse	725	29.20	—0.1	29.96	30.22	18	29.38	8	0.84	01.4	— 0.1	84.2	21	70.0	42.8	5	53.7	41.4	24.1	25	6.4	8	74.4	52.4	4.78	— 0.34	5,566	s.	31	ne.	8	9	5	10	15
Davenport	615	29.36	—0.1	30.00	30.23	23	29.41	8	0.82	63.0	— 1.3	83.0	19	72.4	44.9	23	55.4	38.1	26.1	24	4.4	30	73.4	53.3	4.19	+ 0.90	5,135	sw.	31	sw.	8	10	10	10	10
Des Moines	849	29.10	—0.1	29.98	30.29	1	29.39	8	0.90	63.5	— 0.3	87.1	21	73.0	45.2	23	55.6	41.9	28.8	15	4.3	8	77.0	55.5	4.82	+ 1.63	3,694	sw.	22	s.	12	11	12	9	9
Dubuque	665	29.30	.....	29.99	30 24	18	29.38	8	0.80	01.7	— 1.0	85.6	21	71.4	41.9	6	53.3	43.7	27.5	24	4.5	30	75.1	52.7	4.58	— 0.31	3,009	nw.	16	s.	12	13	8	10	12
Keokuk	618	29.35	—0.1	29.99	30.24	1	29.49	8	0.74	04.6	— 1.7	84.1	21	73.7	46.1	23	56.5	38.0	28.2	24	4.1	30	75.0	55.6	3.77	+ 0.13	5,453	s.	27	s.	12	11	9	8	13
Cairo	359	29.66	—0.4	30.01	30.23	18	29.70	8	0.53	69.3	— 0.3	85.4	22	76.5	50.6	23	62.8	34.8	22.4	24	4.0	29	76.9	61.1	4.70	+ 2.19	4,204	n.	30	s.	8	12	10	13	7
Springfield	644	29.34	—0.3	29.99	30.23	18	29.54	8	0.68	64.9	— 1.4	82.3	21	73.1	44.5	23	56.9	37.8	27.4	24	4.4	29	70.7	54.1	4.47	+ 1.21	4,024	s.	29	sw.	8	9	7	10	13
Saint Louis	571	29.43	—0.1	30.01	30.24	18	29.59	8	0.65	68.4	+ 0.2	84.0	21	76.3	50.1	23	62.0	33.9	21.1	24	4.4	29	74.6	59.3	8.98	+ 6.18	6,730	se.	48	w.	4	11	10	7	13
Missouri Valley.																													
Lamar	1,028	28.95	.....	30.00	30.25	18	29.70	8	0.55	66.3	.....	85.6	21	77.2	49.6	23	58.0	36.0	29.2	25	4.8	30	79.6	58.9	13.24	.....	5,914	se.	30	ne.	5	11	7	12	11
Leavenworth	842	29.12	—0.1	29.98	30.29	1	29.60	8	0.69	66.1	— 1.1	85.5	21	75.5	46.0	2	56.0	39.5	30.5	24	7.0	30	75.2	57.1	7.65	+ 4.39	4,294	s.	21	s.	12	12	8	5	17
Omaha	1,113	28.85	+0.1	29.99	30.34	1	29.51	11	0.83	64.5	+ 0.8	88.9	21	74.0	45.5	5	56.8	43.4	27.4	15	6.1	8	75.3	55.5	2.50	— 1.10	6,235	s.	21	s.	11	8	7	10	13
Valentine	2,603	27.29	.....	29.92	30.40	1	29.47	11	0.94	59.8	.....	94.2	24	74.0	35.4	30	48.1	58.8	45.8	24	7.3	6	61.4	43.2	2.23	.....	7,410	s.	54	n.	11	6	7	7	10
Fort Bennett	1,510	28.38	..	29.97	30.34	30	29.57	24	0.78	60.1	— 0.1	94.2	24	73.8	34.2	30	49.2	60.0	47.4	24	3.0	7	67.4	47.3	1.47	+ 0.28	4,964	s.	29	n.	16	6	6	9	15
Fort Sully	.....	.....	.....	.....	.....	.....	.....	.....	.....	63.1	.....	97.6	24	77.1	34.3	5	49.0	63.3	.....	.....	.....	.....	.....	.....	1.77	+ 0.64	.....	n.	.....	.....	.....	.....	.....	.....	.....
Huron	1,305	28.57	—0.1	29.95	30.30	5	29.40	11	0.90	59.1	+ 1.1	90.7	25	72.6	31.1	5	48.3	59.0	40.4	24	5.7	8	75.7	50.7	2.61	+ 0.88	5,782	se.	31	se.	10	7	5	11	14
Yankton	1,228	28.67	—0.1	29.96	30.33	1	29.37	11	0.96	62.4	+ 1.2	91.6	20	74.9	37.7	5	52.2	53.9	40.9	24	3.2	7	73.5	52.5	4.80	+ 2.07	5,664	se.	37	e.	12	7	6	12	12
Northern slope.																													
Fort Assinaboine	2,720	27.10	+0.5	29.97	30.27	4	29.54	9	0.73	57.3	+ 4.1	92.7	23	72.3	35.7	20	43.9	57.0	43.8	22	11.8	3	54.1	39.5	0.17	— 1.34	7,714	w.	51	sw.	9	4	4	9	17
Fort Benton	2,681	27.17	.....	30.01	30.32	4	29.56	9	0.70	57.9	+ 1.8	93.4	23	74.6	33.6	26	44.2	59.8	51.9	18	11.3	4	54.1	38.9	0.25	— 0.85	5,300	sw.	42	w.	9	5	4	17	9
Fort Custer	3,040	26.82	—0.1	29.94	30.23	4	29.53	24	0.70	59.1	+ 1.7	90.0	23	75.0	36.0	17	45.0	60.0	49.2	23	10.8	4	55.2	40.5	0.68	— 0.07	4,571	e.	39	nw.	13	7	4	14	12
Fort Maginnis	4,340	25.54	.....	29.94	30.18	21	29.60	13	0.58	54.0	+ 2.5	88.7	23	68.6	28.9	5	41.6	59.8	39.7	27	9.8	4	67.2	42.9	1.13	+ 0.58	6,501	w.	44	w.	9	14	10	16	4
Fort Shaw	3,550	26.31	.....	29 93	30 19	4	29.49	9	0.70	59.0	+ 3.0	90.2	23	71.4	33.4	26	42.9	56.8	44.3	18	13.2	2	57.4	39.5	0.25	— 1.53	5,619	w.	68	sw.	13	4	6	15	9
Helena	4,044	25.81	—0.5	29.93	30.17	30	29.55	9	0.62	55.4	— 0.6	88.1	23	69.2	37.8	17	44.9	50.2	37.8	18	6.8	5	69.6	44.8	0.11	— 1.75	4,329	sw.	23	sw.	12	3	5	14	11
Poplar River	2,030	27.80	.....	29.96	30.32	1	29.51	24	0.80	54.4	.....	91.5	23	72.4	24.2	4	38.2	67.3	53.0	15	15.4	2	71.9	44.0	0.15	+ 0.06	4,882	w.	36	n.	25	4	1	10	19
Deadwood	4,600	25.41	+0.2	29.97	30.27	1	29 64	11	0.63	54.7	+ 1.3	83.3	24	65.1	35.5	4	44.1	47.8	34.1	15	0.3	6	70.7	44.4	0.90	— 0.10	2,901	ne.	16	ne.	25	6	4	7	19
Cheyenne	6,105	24.07	—0.1	29.94	30.19	22	29.54	11	0.65	55.7	+ 0.2	84.8	24	70.1	34.2	17	43.7	50.6	38.0	15	10.6	5	59.3	39.2	0.69	— 0.20	7,192	nw.	44	w.	13	9	1	10	13
North Platte	2,841	27.07	—0.1	29.93	30.30	1	29.36	11	0.94	62.2	+ 0.5	90.0	24	74.3	42.9	14	51.7	47.1	41.6	24	6.4	6	71.0	51.0	0.80	— 0.54	6,293	s.	38	nw.	11	7	6	8	16
Middle slope																													
Denver	5,294	24.80	0.0	29.90	30.18	22	29.47	11	0.70	61.9	+ 0.8	89.6	23	76.0	42.3	29	49.6	47.1	36.2	15	6.4	6	54.0	41.9	1.22	+ 0.32	4,561	s.	36	nw.	12	9	3	13	14
Pike's Peak	14,134	18.01	.....	29.98	30.21	22	29.66	11	0.55	31.0	— 1.2	47.3	17	38.1	13.0	12	20.1	34.3	16.5	10	5.4	30	79.0	25.0	1.04	— 0.89	10,956	sw.	52	nw.	13	10	2	11	17
West Las Animas	3,899	26.06	0.0	29.86	30.17	1	29.41	11	0.76	63.9	— 1.5	95.6	16	81.9	35.6	13	48.9	60.0	52.9	13	11.5	5	66.5	50.0	0.99	+ 0.52	4,503	e.	32	n.	1	5	3	10	17
Concordia	1,384	28.52	.....	29.94	30.27	1	29.47	11	0.80	65.6	.....	94.0	24	77.4	45.8	9	56.2	48.2	35.6	23	5.1	28	74.2	55.9	3.53	.....	6,830	s.	35	s.	12	8	5	9	16
Dodge City	2,517	27.41	0.0	29.92	30.23	1	29.45	11	0.78	66.0	— 1.2	88.0	24	78.5	48.0	5	56.6	40.0	35.0	24	8.0	5	72.3	55.0	3.48	+ 2.41	9,129	se.	51	nw.	7	8	4	8	18
Fort Reno	.....	.....	.....	.....	.....	.....	.....	.....	.....	75.0	.....	95.4	24	84.8	50.2	30	65.3	45.2	.....	.....	.....	.....	.....	.....	3.62	+ 0.40	.....	.....	.....	.....	7	.....	.....	.....
Fort Supply	.....	.....	.....	.....	.....	.....	.....	.....	.....	70.8	.....	91.2	4	82.2	50.5	30	59.3	40.7	.....	.....	.....	.....	.....	.....	3.41	+ 0.89	.....	.....	.....	.....	9	.....	.....	.....
Southern slope.																													
Fort Sill	1,200	28 73	—0.5	29.92	30.14	18	29.63	11	0.50	71.7	— 1.2	91.0	4	84.3	52.5	25	60.7	38.5	34.0	24	10.0	28	75.8	62.4	2.83	+ 0.11	5,503	n.	30	s.	11	5	2	15	13
Fort Concho ‡	1,900	28.04	—0.8	29.91	30.11	15	29.70	11	0.41	70.3	.....	94.0	5	88.6	63.0	15	66.4	31.0	28.7	4	10.0	9	77.9	68.0	2.21	.....	2,395	s.	24	w.	9	5	3	9	3
Fort Davis	4,928	25.52	—0.2	29.88	30.00	22	29.74	11	0.26	68.1	+ 1.1	89.0	5	83.1	49.5	24	57.5	39.5	33.7	13	16.0	18	58.2	50.4	1.58	— 0.58	3,937	ne.	29	n.	1	5	0	10	20
Fort Stanton †	.....	.....	.....	.....	.....	.....	.....	.....	.....	61.9	.....	85.0	20	77.0	32.0	25	46.9	53.0	.....	.....	.....	.....	.....	.....	1.36	.....	.....	.....	.....	.....	3	.....	.....	.....
Southern plateau.																													
El Paso	6,764	26.26	—0.1	29.88	30.08	18	29.66	11	0.42	72.6	+ 0.1	93.2	4	88.7	48.9	25	60.9	44.3	38.4	14	14.4	30	45.3	47.7	0.22	— 1.14	2,512	e.	19	ne.	21	5	2	6	22
Lava	.....	.....	.....	.....	.....	.....	.....	.....	.....	68.4	.....	102.0	16	82.9	48.0	14	53.9	54.0	.....	..	.....	.....	.....	.....	0.06	.....	.....	.....	.....	.....	1	.....	.....	.....
Santa Fé	7,026	23.36	+0.5	29.92	30.10	18	29.65	11	0.45	59.7	+ 0.7	81.0	20	72.5	40.0	28	48.5	41.0	34.0	13	15.0	6	49.2	39.0	1.87	+ 0.62	4,743	sw.	26	w.	12	6	0	13	17
Fort Apache	5,050	25.07	+0.2	29.84	29.98	23	29.70	11	0.28	60.0	+ 3.0	93.2	20	85.4	38.2	28	48.4	55.0	47.3	14	24.6	7	47.3	42.7	0.44	— 1.33	4,741	e.	25	sw.	6	4	0	9	21
Fort Bowie	.....	.....	.....	.....	.....	.....	.....	.....	.....	67.1	.....	90.0	3	89.1	37.0	30	45.2	59.0	.....	.....	.....	.....	.....	.....	0.44	.....	.....	.....	.....	.....	4	.....	.....	.....
Fort Grant	4,856	25.24	.....	29.81	29.91	23	29.69	11	0.22	72.4	+ 1.4	91.3	17	84.2	55	8 11	62.7	35.5	26.2	13	15.8	18	36.7	42.3	0.81	— 0.47	4,974	se.	37	se.	17	7	0	7	23
Fort McDowell	.....	.....	.....	.....	.....	.....	.....	.....	.....	82.2	.....	111.5	20	101.5	51.5	28	62.9	00.0	.....	.....	.....	.....	.....	.....	0.90	.. ..	.....	.....	.....	.....	1	.....	.....	.....
Fort Thomas	2,710	27.18	.... ..	29.79	29.94	13	29.64	25	0 20	75.1	+ 2.4	98.5	19	92.4	43.0	28	56.5	55.5	47.8	14	16.7	10	40.2	45.2	0.02	— 0.64	.....	s.	.....	.....	1	.....	0	6	24
Fort Verde	.....	.....	.....	.....	.....	.....	.....	.....	.....	74.1	+ 0.8	99.0	21	92.5	46.0	28	55.8	53.0	.....	.....	.....	.....	.....	.....	0.03	— 1.24	.....	.....	.....	.....	2	.....	.....	.....
Maricopa	.....	.....	.....	.....	.....	.....	.....	.....	.....	84.2	.....	108.5	17	101.6	44.6	3	66.9	03.9	.....	.....	.....	.....	.....	.....	trace	.....	.....	.....	.....	.....	1	.....	.....	.....
Phoenix	.....	.....	.....	.....	.....	.....	.....	.....	.....	79.3	— 1.8	112.7	20	104.1	43.9	8	54.5	68.8	.....	.....	.....	.....	.....	.....	0.07	— 0.74	.....	.....	.....	.....	1	.....	.....	.....
Prescott	5,389	24.76	0.0	29.88	30.01	1	29.09	11	0.32	04.9	+ 1.9	89.6	17	82.8	39.4	27	49.3	50.2	41.1	28	17.8	11	43.6	39.7	0.11	— 1.14	4,478	s.	36	s.	6	1	0	3	27
San Carlos	.....	.....	.....	.....	.....	.....	.....	.....	.....	76.0	.....	101.8	3	94.8	49.0	29	01.3	52.8	.....	.....	.....	.....	.....	.....	0.34	— 0.52	.....	.....	.....	.....	2	.....	.....	.....
Wickenburg	.....	.....	.....	.....	.....	.....	.....	.....	.....	78.2	+ 3.6	106.5	21	98.1	48.5	29	58.3	58.0	.....	.....	.....	.....	.....	.....	0.04	— 0.71	.....	.....	.....	.....	1	.....	.....	.....
Willcox	.....	.....	.....	.....	.....	.....	.....	.....	.....	71.4	.....	100.0	17	91.8	42.0	28	51.0	58.0	.....	.....	.....	.....	.....	.....	1.11	.....	.....	.....	.....	.....	3	.....	.....	.....
Keeler	.....	26.26	.....	.....	.....	.....	.....	.....	0.44	74.1	.....	97.2	2	87.1	49.7	25	62.1	47.5	39.3	1	14.7	24	32.3	41.3	0.00	.....	3,580	sw.	42	s.	24	0	0	1	29
Middle plateau																													
Winnemucca	4,332	25.62	+0.1	29.91	30.14	30	29.59	24	0.55	61.7	+ 1.6	88.4	1	76.6	30.8	26	44.0	57.6	43.5	28	15.2	25	32.1	28.3	0.08	— 0.31	4,734	sw.	33	sw.	24	1	1	4	25
Frisco	.....	23.74	.....	.....	.....	.....	.....	.....	0.45	63.6	.....	81.5	22	73.8	36.0	11	55.2	45 5	26.5	13	11.7	24	29.7	29.1	0.07	.....	7,973	sw.	42	sw.	25	1	0	6	24
Salt Lake City	4,348	25.62	—0.2	29.86	30.07	21	29.53	24	0.54	04.8	+ 0.6	90.0	23	77.9	42.4	12	52.3	47.6	35.4	13	13.3	10	52.7	45.3	1.29	+ 0.44	3,584	se.	22	se.	24	4	6	9	15
Montrose	5,800	24.35	.....	29.95	30.13	22	29.64	11	0.49	59.8	.....	86.0	22	77.5	31.1	13	45.7	54.9	41.7	15	10.9	11	51.0	38.6	0.53	.....	5,907	se.	36	se.	11	6	2	10	18
Fort Bridger	.....	23.50	.....	.....	.....	.....	.....	.....	0.55	51.8	.....	78.7	22	68.8	30.6	12	38.4	48.1	41.8	3	17.9	12	56.6	34.5	0.99	.....	5,282	sw.	30	sw.	13	5	4	7	19
Northern plateau.																													
Cœur d'Alene	.....	.....	.....	.....	.....	.....	.....	.....	.....	58 6	.....	87.0	3	72.3	36.0	27	44.9	51.0	.....	.....	.....	.....	.....	.....	1.21	+ 0.27	.....	.....	.....	.....	5	.....	.....	.....
Lewiston	785	29.13	.....	29.91	30.26	30	29.56	23	0.70	63.1	+ 3.4	89.6	22	76.4	41.5	26	52.0	48.1	35.4	22	12.2	10	58.2	46.7	0.66	+ 0.04	2,183	se.	26	sw.	9	4	3	8	19
Ashland	.....	.....	.....	.....	.....	.....	.....	.....	.....	61.9	.....	90.0	14	81.4	34.0	21	42.4	56.0	.....	.....	.....	.....	.....	.....	1.18	.....	.....	.....	.....	.....	2	.....	.....	.....
Linkville	.....	.....	.....	.....	.....	.....	.....	.....	.....	55.9	.....	82.0	14	72.4	32.5	11	39.4	49.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dayton	1,667	28.22	.....	29.97	30.24	30	29.65	9	0.59	60.3	+ 2.1	88.4	1	76.6	36.0	27	47.3	52.4	40.0	14	13.5	9	61.3	45.1	1.15	+ 0.32	3,771	sw.	25	sw.	13	8	3	8	19
Fort Spokane	.....	.....	.....	.....	.....	.....	.....	.....	.....	58.5	.....	88.0	1	74.0	34.0	27	42.9	54.0	.....	.....	.....	.....	.....	.....	1.14	.....	.....	.....	.....	.....	6	.....	.....	.....
North Pacific coast region																													
Fort Canby	179	29.75	.....	29.95	30.19	16	29.69	23	0.50	58.5	.....	69.7	21	62.6	49.1	16	54.0	20.6	14.8	16	4.4	12	90.7	55.8	3.43	.....	5,893	w.	42	w.	23	17	8	15	7
Olympia	36	29.91	—0.9	29.95	30.21	16	29.60	9	0.62	57.9	+ 2.3	73.9	14	68.2	43.2	18	49.8	30.7	28.8	17	6.7	28	86.0	53.6	3.69	+ 0.70	2,719	n.	20	nw.	14	15	6	15	9
Port Angeles	14	29.91	.....	29.93	30.21	1	29.56	9	0.65	52.9	.....	66.9	2	60.4	37.7	25	46.7	29.2	20.8	25	5.3	28	92.6	50.7	3.25	.....	2,686	s.	20	nw.	24	15	9	11	10
Pysht	.....	.....	.....	.....	.....	.....	.....	.....	.....	55.8	.....	72.0	2	63.5	42.0	24	48.0	30.0	.....	.....	.....	.....	.....	.....	9.44	.....	.....	.....	.....	.....	18	.....	.....	.....
Tattoosh Island	86	29.83	.....	29.93	30.21	1	29.55	9	0.66	56.0	.....	65.6	4	60.5	49.2	15	51.9	16.4	15.6	2	4.2	19	91.7	53.5	9.60	.....	7,829	sw.	37	s.	20	16	18	8	4
Astoria	.....	.....	.....	.....	.....	.....	.....	.....	.....	60.6	.....	72.0	3	66.5	49.0	20	54.7	23.0	.....	.....	.....	.....	.....	.....	4.24	.....	.....	.....	.....	.....	15	.....	.....	.....
Portland	80	29.88	—0.8	29.97	30.24	16	29.71	9	0.53	62.2	+ 1.7	85.0	22	75.8	41.0	25	51.1	44.0	35.0	17	12.0	28	73.8	52.9	2.48	+ 0.66	3,597	nw.	21	sw.	12	9	6	12	11
Roseburg	523	29.44	—0.2	29.99	30.18	1	29.68	23	0.49	62.3	+ 1.9	89.4	14	78.0	37.8	26	49.0	52.1	40.0	26	11.0	24	66.9	49.7	0.36	— 0.64	1,510	nw.	16	sw.	28	6	3	11	16
Mid. Pacific coast region																													
Cape Mendocino	637	29.30	0.0	29.97	30.09	15	29.80	23	0.28	57.6	+ 0.4	76.6	30	63.4	48.0	2	51.8	28.6	21.6	30	6.9	16	81.4	51.7	1.59	+ 0.66	14,310	n.	47	se.	23	3	0	9	21
Red Bluff	332	29.53	—0.3	29.86	30.00	13	29.67	23	0.33	74.8	+ 1.0	99.5	20	88.4	51.5	25	60.7	48.0	35.0	20	16.5	5	39.2	45.5	2.91	+ 2.49	4,081	nw.	24	s.	24	1	0	3	27
Sacramento	64	29.81	—0.3	29.86	29.97	1	29.74	10	0.23	69.8	+ 0.7	98.5	22	88.2	50.5	26	56.3	48.0	41.8	20	14.0	24	52.6	49.4	0.08	— 0.25	4,468	s.	20	nw.	25	1	0	3	27
San Francisco	60	29.86	—0.4	29.91	30.01	1	29.80	10	0.21	60.7	+ 1.0	87.0	21	68.3	52.0	2	55.1	35.0	27.0	21	5.5	3	80.1	53.8	0.11	— 0.05	6,688	n.	32	w.	23	1	5	10	15
South Pacific coast region																													
Los Angeles	371	29.47	—0.9	29.82	29.98	1	29.68	20	0.24	69.5	+ 2.0

Moorhead, Minnesota, 15th: a very brilliant aurora appeared at 9.15 p. m., with waves of light extending upwards 50°; at 11.45 it was very faint.

Saint Vincent, Minnesota, 15th: an aurora appeared at 9.20 p. m. as an irregular arch extending over 160° of the horizon and to an altitude of 45°. At 10.15 the arch faded away and was immediately followed by bright, yellow streamers which extended to within 5° to 10° of the zenith. The display continued until early morning of the 16th.

Bismarck, Dakota, 15th: at 9.35 p. m. an auroral light extended from azimuth 175° to 235° and to an altitude of 20°; at 11 p. m. a band of pale, yellow light extended from horizon to horizon, passing about 4° south of the zenith and distant about 56° from the light in the north. This band disappeared at 11.35, when the light in the north attained its greatest brilliancy and streamers appeared. The display continued until 4.30 a. m. of the 16th.

Chicago, Illinois, 15th: an aurora is reported to have been observed by persons in the surrounding country, though it was not seen at this station. Streamers and "merry dancers" were noted, but during the greater part of the display only a diffuse, straw-colored light was observed.

Marquette, Michigan, 15th: an aurora was observed at 9.35 p. m.; at 11 p. m. the phenomenon assumed a peculiar form; the arch having partly disappeared, waves of light, resembling puffs of smoke, rose from the horizon and converged to a point 10° south of the zenith. At one time these waves of light covered 45° of the sky.

Mackinaw City, Michigan; during the evening of the 15th and the early morning of the 16th indications of the existence of an auroral display were observed, at times, through breaks in the clouds.

Escanaba, Michigan, 15th: an aurora was observed at 9.36 p. m.; from 10.37 to 11.11 p. m. bright flashes, having a waving motion, were observed. The display ended at 11.29 p. m.

Detroit, Michigan, 15th: an aurora was observed at 10.30 p. m.; pale streamers shot upward to an altitude of 45°; these soon disappeared.

Sandusky, Ohio, 15th: a faint aurora, covering 90° of the northern horizon, was observed from 10 to 11 p. m.

Erie, Pennsylvania, 15th: an aurora was observed from 9.15 to 11.20 p. m. consisting of beams reaching various altitudes between 5° and 90°, with a quick, lateral motion from northwest to northeast.

Buffalo, New York, 15th: when the sky cleared at 11 p. m., a beautiful auroral display was visible; it is probable that had not cloudiness prevailed it would have been seen earlier. It consisted of an arch of light from which beams of whitish color shot upward, at times reaching the zenith, and having a quivering motion.

Logansport, Indiana, 15th: a bright aurora appeared at 9 p.m.; at 9.30 the light was very brilliant, and numerous streamers flashed upward to an altitude of 25°. The moonlight diminished the brilliancy of the display; and at 10 p. m. no traces of it remained.

Albany, New York, 15th: an auroral light was visible from 8 to 10.20 p. m., covering 60° of the horizon and extending to an altitude of 20°; several streamers of whitish color shot upward to an altitude of 30°.

Eastport, Maine, 15th: a brilliant auroral arch was observed from 7 p. m. until 2 a. m. of the 16th; waves of light shot upward to the zenith and frequently to beyond that point. The arch covered 90° of the northern horizon.

Manistique, Michigan, 15th: an aurora was observed from 8.30 p. m. until daylight of the 16th; at 9 p. m. beams of a bright, greenish color were observed in the northwest, with a motion from east to west; at 9.30 it assumed the form of flashing patches of bright haze, constantly changing in shape and having a waving motion towards the zenith.

Beloit, Wisconsin, 15th: at 9.30 p. m. a pale bank of light was observed in the north; at 10 it had spread over the sky from northwest to northeast, and streamers extended to an altitude of about 50°; it was again observed at 12.30 a. m. as a bank of light, extending to a considerable height.

Portland, Maine, 15th: an aurora was observed from 9 p. m. until after midnight; when first seen it consisted of an irregular arch covering 110° of the horizon and extending to an altitude of 16°; at 10.15 p. m. streamers reached an altitude of 45°. The arch disappeared at 11 p. m. and the light was obscured by clouds after midnight.

Fort Bennett, Dakota, 16th: a faint aurora was observed from 12.05 to 12.25 a. m., consisting of a few small streamers whose lower extremities were 15° above the horizon.

Manistique, Michigan, 15th: an aurora was observed from 10 p. m. to midnight; beams shot upward to an altitude of 30°; the display was very bright near the horizon.

Eastport, Maine, 17th: an auroral light was observed at 10 p. m., lasting until 1 a. m. of the 18th.

Alpena, Michigan, 27th: an aurora was first noticed at 9.40 p. m., consisting of a few small streamers in the north, having an altitude of 30° and an apparent motion from east to west.

Saint Vincent, Minnesota, 29th: a faint auroral display was observed from 10 to 11.15 p. m., consisting of a few streamers which extended to an altitude of from 10° to 15°.

Other auroral displays were observed during the month, as follows:

2d.—Manistique, Michigan.

3d.—Poplar River, Montana; Orono, Gardiner, and Cornish, Maine.

4th.—Lansing and Traverse City, Michigan.

5th.—Cambridge, Massachusetts; Prairie du Chien, Wisconsin.

14th.—Tatoosh Island, Washington Territory; Bangor and Gardiner, Maine; Cambridge, Massachusetts; Palermo, New York; Newport, Vermont.

15th.—Bangor, Gardiner, and Cornish, Maine; Sycamore, Illinois; Independence, Monticello, Manchester, and Humboldt, Iowa; Rochester, Minnesota; Harvard, Nebraska; North Volney, New York; Burlington, Woodstock, and Newport, Vermont; Madison, Embarras, and Prairie du Chien, Wisconsin.

17th.—Woodstock and Newport, Vermont.

18th.—Manistique, Michigan; Archer, Florida, "aurora plainly seen in the north and northeast."

26th.—Cedar Rapids, Iowa.

27th.—Fort Totten, Dakota.

THUNDER-STORMS.

Thunder-storms were reported in the various states and territories, as follows:

Alabama.—4th, 5th, 6th, 9th, 10th, 14th, 15th, 17th, 19th, 30th.

Arizona.—1st to 6th, 9th, 10th, 11th, 25th.

Arkansas.—1st, 2d, 3d, 5th, 7th, 8th, 11th, 12th, 13th, 14th.

California.—1st, 5th, 6th, 24th, 25th.

Colorado.—2d to 7th, 12th, 18th, 20th, 24th, 26th, 27th, 29th, 30th.

Connecticut.—4th, 9th.

Dakota.—1st, 10th, 11th, 12th, 16th, 18th, 19th, 20th, 27th, 28th.

District of Columbia.—4th, 5th, 9th, 22d.

Florida.—1st to 23d, 25th, 27th, 30th.

Georgia.—5th, 8th, 9th, 14th, 15th, 16th.

Illinois.—3d, 4th, 5th, 8th, 12th, 13th, 19th, 29th, 30th.

Indiana.—2d, 3d, 6th, 7th, 8th, 12th, 13th, 19th, 23d, 24th.

Indian Territory.—3d, 4th, 9th, 11th, 27th, 28th.

Iowa.—3d, 4th, 8th, 11th, 12th, 13th, 17th to 20th.

Kansas.—1st to 9th, 11th, 12th, 26th, 27th, 28th.

Kentucky.—4th, 8th.

Louisiana.—1st, 3d, 4th, 5th, 7th, 8th, 9th, 11th, 13th, 14th, 17th to 20th, 29th.

Maine.—19th, 27th.

Maryland.—4th, 5th, 9th.

Massachusetts.—1st, 4th, 9th, 16th.

Michigan.—1st, 8th, 11th, 12th, 13th, 17th, 20th, 21st, 28th, 29th.
Minnesota.—11th, 12th, 17th, 19th.
Mississippi.—7th, 13th.
Missouri.—1st to 7th, 8th, 11th, 12th, 13th, 30th.
Montana.—1st, 10th, 13th, 15th.
Nebraska.—3d, 4th, 7th, 8th, 11th, 17th, 18th, 27th.
New Hampshire.—9th, 22d.
New Jersey.—1st, 4th, 5th, 9th, 15th.
New Mexico.—27th.
New York.—1st, 3d, 4th, 8th, 9th, 13th, 15th, 18th, 21st, 22d.
North Carolina.—3d, 4th, 14th, 15th, 16th, 29th.
Ohio.—1st, 3d, 4th, 8th, 9th, 12th, 13th, 14th, 18th, 19th, 23d.
Oregon.—5th, 9th.
Pennsylvania.—1st, 3d, 4th, 8th, 9th, 18th, 22d, 29th.
South Carolina.—1st, 4th, 5th, 9th, 11th, 14th, 15th, 19th, 29th, 30th.
Tennessee.—2d to 5th, 8th, 9th, 12th to 15th, 18th, 25th, 29th, 30th.
Texas.—1st to 17th, 21st, 22d, 27th to 30th.
Utah.—11th, 12th, 25th.
Vermont.—1st, 9th, 22d.
Virginia.—4th, 5th, 8th, 9th, 14th, 23d.
Washington Territory.—9th, 14th, 15th.
West Virginia.—3d, 4th, 8th, 22d.
Wisconsin.—2d, 8th, 11th, 12th, 17th, 19th, 27th.
Wyoming.—25th.

OPTICAL PHENOMENA.

SOLAR HALOS.

Solar halos were observed in the various states and territories, as follows:
Arizona.—Prescott, 5th.
California.—San Diego, 1st, 2d, 5th, 13th; San Francisco, 4th, 7th, 14th, 28th; Sacramento, 8th; Poway, 5th.
Colorado.—Montrose, 3d, 8th.
Dakota.—Webster, 4th; Fort Buford, 15th, 21st; Fort Totten, 19th; Yankton, 27th.
Florida.—Archer, 4th, 17th, 19th, 20th; Key West, 13th, 16th, 21st; Manatee, 15th.
Georgia.—Augusta, 19th, 26th.
Illinois.—Springfied, 1st, 3d, 5th, 26th; Charleston, 1st, 5th, 11th, 27th; Riley, 4th.
Indiana.—Jeffersonville, 11th, 15th; Laconia, 26th.
Indian Territory.—Fort Reno, 20th.
Iowa.—Cedar Rapids, 1st, 5th, 10th, 13th, 14th, 16th, 21st; Keokuk, 1st, 11th.
Kansas.—Yates Centre, 4th.
Maine.—Cornish, 8th.
Maryland.—Woodstock, 20th, 27th.
Massachusetts.—Amherst, 22d.
Michigan.—Swartz Creek, 6th; Port Huron, 12th, 18th; Grand Haven, 26th, 27th.
Minnesota.—Saint Vincent, 8th; Duluth, 9th.
Missouri.—Saint Louis, 4th.
New Jersey.—Somerville, 21st.
New York.—Mountainville, 4th; Buffalo, 7th, 8th, 11th, 12th, 14th, 24th, 28th, 29th; Palermo and Syracuse, 8th; Albany, 17th; New York City, 21st.
North Carolina.—Fort Macon and Statesville, 17th.
Ohio.—Wauseon, 7th, 27th, 30th; Toledo, 27th; Cleveland, 29th.
Pennsylvania.—Philadelphia, 6th; Dyberry, 21st, 22d; Troy, 22d.
Rhode Island.—Block Island, 21st.
South Carolina.—Stateburg, 8th, 9th, 16th, 17th, 18th, 26th; Spartanburg, 12th, 17th.
Tennessee.—Nashville, 6th, 9th, 15th, 16th, 17th, 26th; Chattanooga, 19th.
Vermont.—Strafford, 8th.
Virginia.—Cape Henry, 9th; Lynchburg, 20th, 27th; Dale Enterprise, 22d, 27th to 30th.
Washington Territory.—Dayton, 16th; Bainbridge Island, 17th.
Wisconsin.—Milwaukee, 6th; Manitowoc, 11th.
Wyoming.—Fort Bridger, 3d, 5th, 29th.

LUNAR HALOS.

Lunar halos were observed in the various states and territories, as follows:
Alabama.—Mobile, 17th, 18th, 20th; Montgomery, 18th.
Arizona.—Fort Apache, 23d.
Arkansas.—Fort Smith, 14th; Little Rock, 18th.
California.—Fort Bidwell, 27th, 28th.
Colorado.—Montrose, 20th.
Connecticut.—Bethel, New Haven, and North Colebrook, 21st.
Dakota.—Fort Totten, 15th; Fort Buford, 21st; Webster, 19th.
Florida.—Manatee, 14th; Jacksonville, 16th; Archer, 16th, 19th; Cedar Keys, 16th, 23d; Key West, 16th, 17th, 19th, 20th, 24th, 26th; Tallahassee, 17th; Sanford, 23d, 24th.
Georgia.—Atlanta, 15th, 17th.
Idaho.—Boisé City, 3d.
Illinois.—Peoria, 26th.
Indiana.—Terre Haute, 17th; Jeffersonville, 19th, 21st, 22d, 23d.
Iowa.—West Union, 22d; Keokuk, 26th.
Kansas.—Wyandotte, 23d, 28th.
Kentucky.—Frankfort, 20th.
Louisiana.—New Orleans, 15th; Point Pleasant, 16th.
Maine.—Bangor, 17th.
Maryland.—Ocean City, 20th; Baltimore, 20th, 27th.
Massachusetts.—Amherst and Deerfield, 20th; Boston, Somerset, and Taunton, 21st.
Michigan.—Manistique, 17th; Escanaba, 17th, 19th; Marquette, 17th, 27th; Alpena and Swartz Creek, 19th; Grand Haven, 26th, 27th.
Minnesota.—Duluth, 19th; Saint Paul, 21st.
Montana.—Fort Benton, 18th; Fort Assinaboine, 19th; Fort Maginnis, 20th; Poplar River, 21st.
Nebraska.—Marquette, 8th.
New Jersey.—Barnegat City, Somerville, Dover, and Princeton, 21st; Readington, 21st, 29th.
New York.—Menand Station (near Albany), 20th; New York City, Mountainville, and Setauket, 21st.
North Carolina.—Wilmington, 5th, 17th; Hatteras, Statesville, and Flat Rock, 17th.
Ohio.—Tiffin, 17th; Wauseon, Sandusky, and Toledo, 27th; Ruggles, 29th.
Oregon.—Linkville, 16th.
Pennsylvania.—Pittsburg, 20th; Philadelphia, Fallsington, and Chambersburg, 21st.
Rhode Island.—Point Judith and Block Island, 21st.
South Carolina.—Spartanburg, 14th, 16th, 26th; Stateburg, 18th.
Tennessee.—Nashville, 15th, 16th; Chattanooga, 15th, 18th, 21st; Knoxville, 17th.
Texas.—Cleburne, 13th; Indianola, 15th, 16th, 20th, 21st; Brownsville, 16th, 17th, 18th; Rio Grande City, 17th, 19th, 20th; Galveston, 20th, 23d; Palestine, 24th.
Virginia.—Cape Henry, 8th, 27th; Bird's Nest, 15th, 20th, 26th, 27th; Wytheville, 17th, 18th, 19th; Dale Enterprise, 17th, 27th, 30th; Fort Myer and Chincoteague, 20th.
Washington Territory.—Tatoosh Island, 13th.
West Virginia.—Parkersburg, 20th.
Wisconsin.—Embarras, 17th; Milwaukee, 28th.
Wyoming.—Fort Laramie, 16th, 17th.

The phases of the moon during September were: last quarter, 2d, 12.09 a. m.; new moon, 8th, 3.37 p. m.; first quarter, 16th, 1.09 a. m.; full moon, 24th, 2.49 a. m.; perigee, 6th, 9 a. m.; apogee, 18th, 5.24 a. m.

MIRAGE.

Huron, Dakota, 5th: a remarkably distinct mirage was observed to the east of this station from 8 to 8.40 a. m. The towns of Cavour and Iroquois, distant, respectively, eight and eighteen miles, were clearly visible, as though only a short distance intervened. A train of cars, distant to the eastward about twenty-five miles, was seen, apparently, in mid-air. Houses, barns, grain-stacks and other objects assumed vast proportions.

New London, Connecticut, 19th: Race Rock light-house and other objects were apparently elevated five degrees above their natural position.

Mackinaw City, Michigan, 23d: a very distinct mirage was observed from 9.05 a. m. to 9.15 p. m., showing the image of a two-masted schooner in mid-air, over Mackinaw Island, about ten miles distant.

Mirages were also observed at the following places:

Webster, Dakota, 1st, 3d to 5th, 9th, 15th, 17th to 19th.

Saint Vincent, Minnesota, 6th.

Marquette, Nebraska, 29th.

Spartanburg, South Carolina, 8th.

MISCELLANEOUS PHENOMENA.

SUNSETS.

The characteristics of the sky, as indicative of fair or foul weather for the succeeding twenty-four hours, have been observed at all Signal Service stations. Reports from one hundred and seventy-one stations show 5,053 observations to have been made, of which four were reported doubtful; of the remainder, 5,049, there were 4,487, or 88.9 per cent., followed by the expected weather.

SUN SPOTS.

Prof. David P. Todd, director of the Lawrence Observatory, Amherst, Massachusetts, furnishes the following record of sun spots for September, 1885:

Date—September, 1885.	No. of new.		Disappeared by solar rotation.		Reappeared by solar rotation.		Total No. visible.		Remarks.
	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	
1, 8 a. m...	1	3	0	0	1	3	4	90‡	
2, 10 a. m...	1	10‡	0	0	0	0	5	100‡	
3, 1 p. m...	0	0	0	10‡	0	0	5	85‡	
4, 10 a. m...	0	0	1	10‡	0	0	4	70‡	
6, 2 p. m..	0	0	.....	.....	.....	.....	3	45‡	
7, 10 a. m...	0	0	0	5‡	0	0	3	35‡	
8, 8 a. m...	1	10‡	0	15‡	1	10‡	4	30‡	
11, 6 a. m...	.....	.....	.....	.....	.....	.....	2	15‡	
12, 5 p. m...	0	0	1	3	0	0	1	12‡	
14, 11 a. m...	2	25‡	0	0	1	1	3	40‡	
16, 8 a. m...	0	10‡	1	15‡	.....	.....	2	20‡	
17, 3 p. m...	1	1	0	0	1	1	3	25‡	
20, 10 a. m...	.....	.....	.....	.....	.....	.....	2	3	
21, 2 p. m..	2	12‡	0	0	2	5	3	15‡	
24, 11 a. m...	.....	.....	.....	.....	.....	.....	4	35‡	
26, 4 p. m...	.....	.....	.....	.....	.....	.....	5	65‡	
27, 5 p. m...	1	2	0	0	0	0	6	35‡	

Faculæ were seen at the time of every observation. ‡ Approximated.

SUNSET DISPLAYS

Concerning sunset displays, the following notes have been received:

Windsor, Shelby county, Illinois: very brilliant sunset displays occurred from the 14th to the 27th.

Sunman, Ripley county, Indiana: the sunsets throughout the month have been similar to the displays of the autumns of 1883 and 1884, though not so bright.

Logansport, Cass county, Indiana: brilliant sunsets were observed on the evenings of the 1st, 14th to 18th, 21st to 27th; those of the 14th, 15th, 17th, 18th, and 23d were unusually bright.

Cedar Rapids, Linn county, Iowa: remarkably bright sunsets were observed from the 10th to 20th.

Des Moines, Iowa: on nearly every clear morning and evening during the month sun-glows were observed.

Wellington, Sumner county, Kansas: brilliant twilight glows were observed without interruption from the 13th to the close of the month, those of the 22d and 23d being especially bright.

Elk Falls, Elk county, Kansas: exceptionally brilliant sunsets were observed on the 21st and 22d.

Genoa, Nance county, Nebraska: during the last two weeks of the month the brilliant glow in the western sky at sunset was very noticeable.

Auburn, New York: the sunsets during the month have been remarkably brilliant.

Embarras, Waupaca county, Wisconsin: bright sunset displays were observed on nearly every clear evening during the month, some of the displays being remarkably brilliant.

Dale Enterprise, Rockingham county, Virginia: the sun-glows during the month were very brilliant.

The following is an extract from the "Bulletin of the New England Meteorological Society" for September, 1885:

The color of the skies after sunset again deserves note. Many observers record special coloring on dates from the 12th to the end of the month. The colors are variously described as orange, crimson, and pink, and the illumination reported as lasting from one-half an hour to over one hour after sunset.

DROUGHT.

Lynchburg, Virginia, 18th: in many sections of this state and in North Carolina no rain has fallen during the last six weeks. The tobacco crop has suffered seriously.

Reidsville, Rockingham county, North Carolina: up to September 20th an unprecedented drought prevailed in this vicinity. The creeks and wells in the surrounding country were nearly dry. It is estimated that in Caswell and Rockingham counties not more than one-half of an average tobacco crop will be produced.

Nashville, Tennessee, 26th: severe drought now prevails in this part of the state. The grass, which two weeks ago was in promising condition, has dried up, and farmers are feeding their stock with winter provender. Owing to the dryness of the soil, ploughing for winter wheat has been retarded.

Amherst, Hampshire county, Massachusetts: severe drought prevailed in this section at the close of the month. The total rainfall for the month was less than one inch.

Yellow Springs, Greene county, Ohio, 30th: during the last seventeen days of the month no rain fell in this vicinity.

Northfield, Rice county, Minnesota, 30th: no rain fell during the last decade of the month, and at the close of the month pastures were suffering in consequence of drought.

Helvetia, Randolph county, West Virginia, 30th: severe drought has prevailed in this region during the month. Pastures have failed, and the water-supply for stock has become insufficient in some localities.

New York City, 30th: drought has prevailed in this vicinity and on Staten Island during the month. In many places wells and cisterns were entirely exhausted, and crops have been damaged to a great extent.

Dale Enterprise, Rockingham county, Virginia, 30th: severe drought prevailed in this locality during the entire month. Farming operations have been seriously retarded, and the water-supply for stock and household uses has been limited.

Wytheville, Wythe county, Virginia, 30th: at the close of the month the ground was unusually dry and the streams were very low.

EARTHQUAKES.

Toronto, Ontario, 4th: quite a severe shock of earthquake was felt in the villages of Campbellford, Hastings, and Norwood, east of here, at 9.40 a. m. of the above date.

Los Angeles, California, 13th: a very perceptible shock of earthquake is reported to have been felt in this city at 4 a. m. The tremor was from southwest to northeast.

San Diego, California, 13th: two slight shocks of earthquake, separated by an interval of about three seconds, were distinctly felt at 7.34 a. m. (eastern time). The wave passed from east to west, and ended with a peculiar jar which produced an effect similar to that caused by a train when suddenly brought to a stand. The two shocks, with the interval between them, were of about twelve seconds' duration.

Poway, San Diego county, California, 13th: two distinct shocks of earthquake were felt at 4 a. m.

Murrieta, San Diego county, California, 13th: three shocks of earthquake occurred here at about 4 a. m. The direction of the earthquake wave was from west to east. No serious effects were produced.

Cahuenga, Los Angeles county, California, 13th: an earthquake shock was felt here at 5 a. m. Six or seven gentle vibrations were felt; direction from northwest to southeast; duration about three seconds.

The following is an extract from "The (Baltimore) Sun" of September 19, 1885:

LONDON, *September* 18.—An earthquake, of eight seconds' duration, occurred to-day at Naples.

Pittsburg, Pennsylvania, 26th: at 3.30 p. m., this date, a shock, resembling an earthquake, was felt at various points along Chartier's railroad, between Mansfield and Washington, a distance of thirty miles.

FOREST AND PRAIRIE FIRES.

Cahuenga, Los Angeles county, California: from the 14th to 20th extensive fires prevailed in the mountains about fifteen miles to the westward of this place. On the 21st and 22d fires occurred in the mountains and hills to the north and east of station.

San Luis Obispo, California: a smoky atmosphere prevailed here during the 20th and 21st, being caused by the prevalence of extensive forest fires to the north and east of this place.

Richardton, Stark county, Dakota: on the 18th a prairie fire started in this vicinity. The prairie grass being very dry, the fires spread rapidly and burned over a very large area, probably one thousand square miles. On the 24th extensive buildings and hay-stacks at the Richardton Ranch, on the South Fork of the Knife River, were burned. At the close of the month the fires had died out.

Bismarck, Dakota: very destructive prairie fires prevailed in this part of the territory from the 18th to 25th. Large areas were burned over, and many buildings were destroyed. In some instances farmers lost their entire possessions. In the vicinities of Steele, Kidder county, Sterling, Burleigh county, and Buffalo, Cass county, the fires destroyed large quantities of hay, grain, out-buildings, etc. At Ayr, Cass county, a large amount of damage was done. In Barnes county numerous out-buildings and much valuable property were destroyed.

Poway, San Diego county, California: from the 16th to 23d forest fires burned over a considerable area to the northeast of this place; no serious damage has been reported.

Prairie and forest fires have also been reported from the following stations:

Bismarck, Dakota, 16th to 21st, 24th, 29th, 30th.
Webster, Dakota, 24th.
Saint Vincent, Minnesota, 10th, 21st, 25th, 26th, 27th, 29th, 30th.
Moorhead, Minnesota, 20th.
Fort Buford, Dakota, 19th, 21st, 22d.
Fort Yates, Dakota, 25th.
Poplar River, Montana, 21st, 22d, 25th, 28th, 29th, 30th.
Fort Maginnis, Montana, 26th, 27th, 29th, 30th.
Fort Supply, Indian Territory, 24th.
Linkville, Oregon, 1st, 8th.
Lakeview, Oregon, 15th.
Los Angeles, California, 21st, 24th.
San Diego, California, 20th, 21st, 23d.
Fort Totten, Dakota, 30th.

INSECTS.

Helvetia, Randolph county, West Virginia, 30th: grasshoppers have caused much injury to the pastures in this vicinity.

Sunman, Ripley county, Indiana, 30th: in many places in this county grasshoppers have completely destroyed the pastures and meadows.

METEORS.

Burlington, Iowa, 2d: an unusually brilliant meteor appeared at 11.15 p. m., near the zenith, and passed to within 20° of the northwestern horizon, remaining visible one and one-half seconds; it exploded like a rocket at its disappearance.

Prescott, Arizona, 10th: at 9 p. m. a very brilliant meteor was seen in the southeastern sky. It was first observed at an altitude of 45° and passed in a direct line toward the horizon and disappeared at an altitude of 10°.

Buckfield, Maine, 26th: at 4.30 a. m. a very brilliant meteor was observed near the southeastern horizon; it passed in a straight line from east to west, being visible for about seven seconds; it was apparently about ten or twelve inches in diameter.

Meteors were also observed in the various states and territories, as follows:

Arizona.—Wickenburg, 5th.
Dakota.—Webster, 18th.
District of Columbia.—Washington City, 18th.
Florida.—Manatee, 4th, 5th, 16th, 28th, 29th, 30th; Limona, 5th, 8th, 29th.
Illinois.—Syracuse, 19th.
Iowa.—Davenport, 14th.
Maine.—Buckfield, 28th.
Maryland.—Woodstock, 1st, 6th, 16th, 30th.
Massachusetts.—Rowe, 14th, 18th, 20th, 29th.
Minnesota.—Rochester, 12th.
Nebraska.—Genoa, 9th.
New Jersey.—Dover, 6th; Beverly, 13th, 21st.
North Carolina.—Wilmington, 9th, 12th; New River Inlet, 29th.
Ohio.—College Hill, 1st.
Oregon.—East Portland, 16th.
Pennsylvania.—Dyberry, 29th.
Virginia.—Fort Myer, 2d, 13th.

MIGRATION OF BIRDS.

Geese flying southward.—Sacramento, California, 8th, 9th to 14th, 28th, 29th; Cape Mendocino, California, 11th, 18th; Red Bluff, California, 27th; Vermillion, Dakota, 13th; Fort Bennett, Dakota, 25th, 26th; Webster and Fort Buford, Dakota, 28th; Cape Henlopen, Delaware, 29th; Keokuk, Iowa, 14th, 15th; Saint Vincent, Minnesota, 16th; Linkville, Oregon, 27th, 28th; Cleburne, Texas, 14th; Pysht, Washington Territory, 8th; Neah Bay, Washington Territory, 9th; Port Angeles, Washington Territory, 27th; Fort Bridger, Wyoming, 27th.

Ducks flying southward.—Des Moines, Iowa, 29th, 30th.

Cranes flying southward.—Allison, Kansas, 11th, 26th.

Cormorant flying south.—Kitty Hawk, North Carolina, 25th.

Rio Grande City, Texas, 3d: several flocks of Mexican parrots were observed flying northward on this date. It is stated that these birds have not been seen in this vicinity since 1868, and their appearance is somewhat remarkable.

POLAR BANDS.

Montrose, Colorado, 18th.
Archer, Florida, 4th.
Riley, Illinois, 6th, 21st.
Salina, Kansas, 17th.
Portland, Maine, 14th.
Somerset, Massachusetts, 7th.
Escanaba, Michigan, 28th.
Beverly, New Jersey, 28th.
Mountainville, New York, 6th, 11th, 14th.
Wauseon, Ohio, 23d.
Nashville, Tennessee, 10th.
Rio Grande City, Texas, 22d, 23d.
El Paso, Texas, 27th, 29th.
Fort Myer, Virginia, 2d.
Dale Enterprise, Virginia, 2d, 27th.
Wytheville, Virginia, 17th.
Prairie du Chien, Wisconsin, 4th, 17th.

SAND STORMS.

Fort Thomas, Arizona, 1st, 2d.
Los Angeles, California, 21st.

WATER-SPOUTS.

The s. s. "City of Para," L. Dexter, commanding, in N. 26° 16′, W. 74° 04′, on September 5th, passed a water-spout.

The s. s. "Flamborough," P. J. Fraser, commanding, in latitude 28° N., longitude 68° W., saw several water-spouts, the weather being calm and the sea smooth.

The bark "Western Chief," F. Sander, commanding, in N. 41° 20′, W. 58° 01′, on the 9th, passed a water-spout.

The ship "Hermon," F. N. Marvin, commanding, in N. 52° 09′, E. 2° 45′, saw a large water-spout. The same vessel, on the 27th, in N. 52° 44′, E. 3° 47′, saw another.

The British s. s. "Laurestina," Robert Batty, commanding, on the 16th, when fifty miles south-southwest of Cape Hatteras, North Carolina, saw four water-spouts in an east and west line moving eastward. They were about two and one-half miles apart, and were crossing the path of the vessel. The two middle spouts disappeared after a heavy peal of thunder, they having been, apparently, dissipated by it, and the remaining ones were soon after hidden by rain.

Meteorological record of voluntary observers and Army post surgeons, September, 1885.

The maximum and minimum temperatures at stations marked thus (*) are from readings of other than standard instruments.

Stations.	Temperature. Maximum.	Minimum.	Mean.	Rainfall.
Alabama.	°	°	°	*Inches*
Birmingham *	93	50	.....	.....
Greensborough *	92	56	75.3	1.84
Mount Vernon B'ks	93	54	77.6	5.05
Arizona.				
McDowell, Fort	111	52	84.0	0.96
Mojave, Fort	112	59	85.8	0.00
Tucson	.....	.....	.....	0.12
Arkansas.				
Clear Lake	90	46	70.1	.....
Lead Hill *	95	45	70.0	3.64
Mount Ida*	90	40	71.5	2.25
California.				
Alcatraz Island	78	50	56.6	0.12
Angel Island	96	52	62.0	0.08
Benicia Barracks	92	55	68.9	0.02
Bidwell, Fort	88	33	63.3	0.10
Cahuenga Valley*	110	.....	.....	0.00
College City *	105	44	71.6	0.08
Fall Brook	110	49	68.0	0.00
Gaston, Fort	96	40	65.7	0.96
Mason, Fort	77	51	59.9	trace.
Murrieta *	107	43	67.5	0.00
Oakland *	89	51	61.9	0.05
Oroville *	97	36	70.1	0.20
Poway *	103	57	69.3	0.00
Presidio of San F	88	47	58.5	0.08
Princeton *	100	52	73.6	0.12
Sacramento*	93	43	67.3	0.08
Salinas *	95	46	58.9	0.02
San Rafael *	97	41	.....	0.03
Colorado.				
Lewis, Fort	82	30	53.4	0.79
Lyon, Fort	96	38	67.8	0.30
Pueblo	.....	.....	.....	0.82
Connecticut.				
Bethel	.....	.....	.....	0.70
Hartford	84	36	57.2	2.26
North Colebrook *	82	24	61.0	0.15
North Stamford *	81	44	61.4	0.65
Voluntown*	84	36	.....	0.85
Dakota.				
Abr. Lincoln, Fort	100	30	58.3	0.22
Buford, Fort	98	30	56.3	0.35
Meade, Fort	94	37	60.4	0.28
Pembina, Fort	83	25	53.7	0.10
Randall, Fort	93	33	63.8	2.36
Richardton*	97	34	57.1	0.10
Sisseton, Fort	96	27	58.2	4.10
Sully, Fort	97	37	62.7	1.58
Totten, Fort	97	29	56.4	0.11
Vermillion	91	32	62.5	3.07
Webster*	98	27	61.9	8.28
Yates, Fort	98	30	60.0	0 24
District of Columbia.				
Distributing Resv'r*	89	50	68.1	3.01
Receiving Reserv'r.*	86	48	68.0	1.88
Rock Creek*	92	51	69.6	.....
West Washington	90	44	65.5	2.62
Florida.				
Archer	94	67	78.6	11.62
Limona*	97	31	79.4	10.64
Manatee *	92	74	81.8	13.68
Mayport *	90	72	80.4	24.43
Merritt's Island	89	73	79.4	11.15
Saint Augustine, Ft	89	67	79.2	12.24
Tallahassee *	88	63	74.0	5.15
Georgia.				
Athens	88	49	70.8	8.65
Forsyth *	92	64	74.0	8.67
Milledgeville*	92	56	75.3	9.38
Illinois.				
Anna	84	47	69.2	4.54
Bunker Hill *	91	40	66.2	5.73
Collinsville	86	44	66.4	6.78
Charleston*	86	42	64.0	4.49
Mattoon *	90	37	67.5	5.30
Peoria*	87	48	66.6	5.28
Riley*	80	36	59.8	3.86
Rockford*	79	41	60.7	4.64
Sandwich *	83	43	63.9	3.58
South Evanston	85	38	.....	4.04
Sycamore	80	35	60.0	6.10
Wilton Centre	90	35	61.8	3.34
Windsor*	85	30	66.4	6.69
Indian Territory.				
Reno, Fort	92	52	70	3.80
Indiana.				
Fort Wayne*	87	45	63.4	3.15
Guilford*	85	36	64.6	3.50
Jeffersonville	85	41	66.4	5.31
Laconia *	86	40	66.7	5.36
Lafayette	88	35	63.2	4.64
Logansport *	95	38	66.1	5.00
Mauzy *	81	33	64.8	2.47
Spiceland	83	37	63.2	2.00
Summan*	84	36	64.3	3.96
Terre Haute*	80	42	.....	9.33?
Vevay	85	43	66.7	3.08
Iowa.				
Cedar Rapids *	82	39	58.3	2.84
Cresco *	86	37	57.8	4.22
Des Moines	88	40	62.2	.....
Guttenberg *	86	38	59.3	4.81
Humboldt*	86	32	60	.....
Independence *	78	44	60.8	3.75
Indianola *	83	44	61.7	2.91
Logan*	90	46	65.2	1.00
Madison, Fort*	84	48	.....	4.13
Manchester	86	42	62	4.93
Monticello	83	40	60.5	3.95
Muscatine*	92	44	65.0	7.88
Oskaloosa *a*	.....	.....	62.9	3.39
Oskaloosa* *b*	82	46	.....	.....
Ottumwa *	87	44	64.3	2.68
West Union *	82	39	58.0	5.06
Kansas.				
Allison *	104	32	67.7	1.96
Atchison *	87	49	65.9	4.60
Elk Falls*	67	45	.....	10.75?
Emporia*	85	49	.....	5.38
Fort Scott	.....	.....	.....	3.55
Independence *	87	52	67.8	7.94
Manhattan	93	52	66.9	4.03
Salina*	78	53	69.0	2.07
Sterling*	89	50	65.6	5.03
Topeka *	94	51	67.9	4.53
Wellington *	93	49	66.2	5.31
W. Leavenworth	85	49	.....	7.50
Westmoreland*	95	45	63.0	4.62
Wyandotte *	88	48	67.8	6.83
Yates Centre *	84	49	65.8	6.99
Kentucky.				
Frankfort	85	40	66.5	3.64
Kentucky—Cont'd.				
Richmond	85.7	30	66.8	2.32
Louisiana.				
Grand Coteau	89	62	77.3	10.58
Liberty Hill*	87	69	78.5	7.66
Luling *	92	60	75.3	9.44
Point Pleasant *	90	59	73.0	9.78
Maine.				
Buckfield*	82	36	.....	3.55
Cornish *	77	37	56.0	2.00
Gardiner	70	40	55.7	1.98
Orono *	78	34	54.4	2.52
Preble, Fort	79	41	58.0	2.20
Waterville	87	36	57.5	.....
Maryland.				
Cumberland	80	44	63.2	0.75
Fallston*	84	40	63.2	0.64
Great Falls*	87	42	66.6	2.68
McDonogh	80	43	63.2	0.80
McHenry, Fort	84	47	64.8	1.00
Woodstock	84	37	62.5	1.52
Massachusetts.				
Amherst *a*	82	40	57.5	0.67
Amherst *b*	81	27	58.3	0.85
Deerfield	83	29	51.7	1.28
Dudley	77	51	63.0	1.75
Fall River*	80	40	63.2	1.31
Leicester	80	34	56.9	1.50
Mendon*	86	41	58.2	.....
Milton	78	35	52.7	1.57
New Bedford	82	37	58.8	1.86
Princeton	78	32	56.0	1.40
Readville	78	33	57.1	1.88
Rowe *	77	34	53.2	1.80
Somerset *	88	39	61.5	1.15
Taunton	87	34	58.9	0.94
Westborough*	85	34	60.1	1.34
Williamstown	75.9	36.6	56.2	1.65
Worcester *	77	38	57.4	0.87
Michigan.				
Birmingham	79	37	.....	2.11
Boyne	96	27	59.1	1.56
Brady, Fort	83	34	55.4	3.14
Harrisville*	84	35	.....	4.18
Kalamazoo *	81	37	.....	3.56
Lansing	82	34	55.9	3.46
Manistique	80	29	55.2	0.94
Mottville*	82	36	.....	3.75
Pentwater	88	29	58.3	3.29
Swartz Creek	82	36	57.6	3.80
Traverse City *	85	36	.....	2.21
Minnesota.				
Minneapolis *	84	40	59.1	5.27
Northfield	85	34	59.7	4.49
Rochester *	84	31	.....	3.80
Snelling, Fort	88	33	59.7	4.40
Missouri.				
Centreville	87	36	.....	6.26
Conception	86	45	64.8	2.47
Independence *	90	42	51.0	8.63
Pierce City *	85	50	67.5	6.90
Springfield	83	47	65.6	6.15
Montana.				
Assinaboine, Fort	96	29	58.2	0.01
Ellis, Fort	91	22	54.4	1.20
Keogh, Fort	99	31	58.2	0.44
Shaw, Fort	91	32	56.8	0.25
Nebraska.				
Crete	92	43	62.7	2.09
De Soto *	92	43	63.3	1.57
Fremont	91	46	65.2	1.08
Genoa	90	46	63.5	2.29
Harvard	100	48	.....	1.50
Marquette *	87	52	.....	2.06
Robinson, Fort	96	35	62.7	0 50
Stockham *	92	58	78.5	1.50
Tecumseh *	92	44	67.4	2.66
Nevada.				
Carson City	95	30	62.0	0.06
McDermitt, Fort	92	35	62.2	0.38
New Hampshire.				
Antrim	.....	.....	.....	2.45
Ashland	.....	.....	.....	1.63
Belmont	.....	.....	.....	0.97
Bristol	.....	.....	.....	1.84
Lake Village	.....	.....	.....	1.45
Nashua	.....	.....	.....	1.48
Wier's Bridge	.....	.....	.....	1.48
Wolfborough	.....	.....	.....	0.99
Woodstock	.....	.....	.....	2.60
New Jersey.				
Beverly *	87	46	64.2	1.69
Dover	88	38	60.1	0.95
Princeton	83	40	63.8	1.08
Readington*	92	50	68.0	0.75
Somerville *	85	42	63.5	0.50
South Orange*	85	44	62.0	0.25
Vineland	93	54	66.6	0.60
New Mexico.				
Gallinas Spring	85	54	.....	trace.
Union, Fort	82	39	63.2	1.24
Wingate, Fort	88	38	62.0	1.32
New York.				
Auburn	74	39	59.4	3.48
Columbus, Fort	85	44	64.5	0.70
Cooperstown *	70	37	56.3	1.96
David's Island	84	42	63.7	0.30
Factoryville*	80	36	57.7	1.87
Humphrey	80	38	58.2	4.44
Ithaca	80	38	57.9	2.36
Le Roy	84	34	59.8	3.54
Madison Barracks	78	28	58.6	3.28
Menand Station *	80	42	58.9	1.74
Mountainville	84	37	60.1	0.82
Niagara, Fort	82	40	60.2	2.12
North Volney *	80	40	57.9	3.30
Palermo*	75	36	56.4	3.99
Penn Yan	.....	.....	.....	2.05
Platteburg B'ks	81	37	56.5	3.22
Setauket	81	44	62.5	0.93
West Point	86	40	63.9	0.90
White Plains	78	38	62.3	1.20
North Carolina.				
Flat Rock *	82	40	62.9	3.91
Lenoir*	82	42	.....	3.30
Lincolnton *	81	49	67.8	4.10
Statesville*	90	44	70.6	2.20
Weldon *	93	44	71.1	1.58
Ohio.				
Cincinnati*	86	44	68.4	3.06
Cleveland *	84	43	61.3	1.97
Clyde*	82	45	.....	1.37
College Hill*	84	41	66.7	3.25
Garrettsville	84	36	57.6	2.31
Hiram *	81	39	60.6	2.81
Jacksonborough*	90	36	64.0	4.50
Napoleon*	82	37	63.0	3.03
North Lewisburg	86	38	64.8	3.15
Portsmouth	83	40	63.6	2.40
Ruggles *	80	40	59.0	2.10
Springfield *	80	40	60.0	5.45
Tiffin *	84	41	63.2	1.78
Wauseon	87	31	60.7	2.14
Westerville	80	30	60.7	2.71
Yellow Springs *	88	37	61.3	2.76
Oregon.				
Albany*	88	44	62.8	2.13
Bandon*	72	41	54.6	2.32
East Portland *	82	44	.....	1.13
Eola *	80	48	61.0	2.67
Klamath, Fort	90	20	52.2	0.78
Pennsylvania.				
Altoona	84	43	64.3	0.82
Blooming Grove *	83	40	59.6	1.00
Catawissa	83	42	62.8	0.97
Chambersburg*	85	52	65.3	0.93
Drifton	82	38	59.1	1.39
Dyberry*	78	35	56.8	1.04
Easton *a*	.....	.....	.....	0.59
Easton *b**	86	52	67.9	.....
Fallsington	82	42	61.7	1.07
Franklin*	76	32	52.6	3.09
Germantown*	84	44	.....	0.83
Grampian Hills*	82	38	59.9	1.14
Mahanoy Plane *	84	45	64.2	0.76
South Bethlehem	89	40	62.4	0.64
Tidioute	93	36	60.3	0.61
Troy	83	33	57.4	1.40
Wellsborough *	84	38	58.1	2.55
West Chester	84	42	62.7	1.49
Wilkesbarre*	86	38.5	59.9	1.20
Wysox*	82	40	61.0	1.12
South Carolina.				
Kirkwood *	79	48	69.4	2.34
Pacolet *	79	60	70.9	2.92
Spartanburg *	76	26	52.1	4.20
Stateburg*	88	52	71.8	3.48
Tennessee.				
Ashwood *	90	50	70.0	4.71
Milan	92	41	70.3	3.66
Texas.				
Austin *	94	58	80.0	.....
Brown, Fort	94	68	81.1	3.84
Cleburne *	91	53	75.0	2.51
Comfort	.....	.....	.....	3.62
Concho, Fort	96	53	77.1	1.94
Corpus Christi *	93	70	.....	.....
Corsicana	.....	.....	.....	1.31
Huntsville *	93	59	.....	5.35
New Ulm	90	60	77.8	3.51
Vermont.				
Brattleborough	86	34	57.4	1.36
Burlington	80	38	59.4	3.50
Charlotte*	81	38	49.0	5.70
Dorset	78	33	54.8	2.95
Lunenburg	75	35	53.3	2.90
Newport*	76	36	55.6	4.26
Post Mills Village*	82	31	55.7	.....
Strafford	78	36	58.0	2.90
Woodstock	82	32	55.1	2.35
Virginia.				
Accotink *	94	45	68.4	1.48
Bird's Nest*	91	53	71.7	3.00
Bruington	.....	.....	.....	1.14
Dale Enterprise*	95	39	71.1	1.04

Meteorological record of voluntary observers, etc.—Continued.

Meteorological record of voluntary observers, etc.—Continued.

Stations.	Temperature. Maximum.	Minimum.	Mean.	Rainfall.	Stations.	Temperature. Maximum.	Minimum.	Mean.	Rainfall.
Virginia—Cont'd.	°	°	°	*Inches*	*Wisconsin.*	°	°	°	*Inches*
Marion*	84	36	63.9	0.95	Beloit	82	40	60.5	4.56
Monroe, Fort	86	48	70.2	3.01	Embarras*	86	36	60.9	2.05
Snowville*	80	43	.....	.....	Franklin	.....	.....	....	4.25
Summit*	95	35	66.7	.....	Madison	79	42	59.9	4.05
Wytheville	82	35	63.1	1.66	Manitowoc	86	34	60.1	3.67
Washington Territory.					Neillsville*	79	22	51.9	4.20
Bainbridge Island*	75	44	60.0	4.27	Prairie du Chien*	83	41	61.4	4.53
Tacoma*	75	46	58.8	2.44	Wausau	85	28	57.4	2.06
Townsend, Fort	75	42	58.8	2.10	*Wyoming.*				
West Virginia.					Bridger, Fort	80	29	54.3	0.49
Helvetia*	85	32	59.9	1.43	Fred Steele, Fort	87	31	57.1	0.44
Parkersburg	83	37	65.9	0.20					
Wellsburg	.....	.....	.....	1.93					

NOTES AND EXTRACTS.

The following is an extract from the September, 1885, report of the "Alabama Weather Service" under direction of Prof. P. H. Mell, jr., Auburn:

This month has been characterized by conditions almost opposite to those indicated in September, 1884. The atmosphere has been very moist and the precipitation has been frequent; while in September of last year the average rainfall for the state was only 0.40 of an inch—the drouth was excessive and destructive. The rains during the month just closed were injurious to agricultural interests all over the state. The cotton that was open and ready to pick was not only beaten out by the rains, but the bolls were also destroyed in great numbers by rotting and falling from the plant. In many sections of the state the observers report the cotton sprouting on account of the moist condition of the atmosphere. It has also been observed that the numerous cloudy days prevented the plants from receiving as much of the sun's heating and invigorating rays as was required by the bolls, and they did not, therefore, open as rapidly as was consistent with the welfare of the staple. Added to these misfortunes, may be mentioned the vast destruction resulting from the attacks of the cotton caterpillar and the rust. It has, therefore, been estimated that these three counteracting influences will reduce the yield of cotton for the state of Alabama much below the average.

The temperature of the month has been mild, without any sudden, unpleasant changes, and the amount of sickness throughout the state has not been as great as was reported for September bulletin of 1884.

State summary.

Mean temperature, 73°.1; highest temperature, 95°, at Livingston, on the 8th; lowest temperature, 40°, at Gadsden and Pine Apple, on the 24th; range of temperature, 49°; greatest monthly range of temperature, 43°, at Pine Apple; least monthly range of temperature, 26°, at Lafayette; mean daily range, 13°.4; greatest daily range of temperature, 37°, at Pine Apple, on the 24th; least daily range of temperature, 0°.6, at Union Springs, on the 21st.

Mean depth of rainfall, 5.24 inches; mean daily rainfall, 0.18; greatest depth of monthly rainfall, 10.00 inches, at Roanoke; least depth of monthly rainfall, 0.70, at Selma; greatest daily rainfall average for state, 0.695 of an inch, on the 29th; greatest daily local rainfall, 6.33 inches, at Tuscumbia, on the 29th.

Average number of days on which rain fell, 11; average number of cloudy days, 14; average number of fair days, 8; average number of clear days, 8; warmest day, 15th; Coldest day, 24th.

Prevailing direction of wind, east.

Chattanooga reports that the greatest velocity of wind was nineteen miles per hour from the northeast. Montgomery, twenty-two miles from the east.

The following meteorological summary and accompany remarks are from the Georgia "Crop Report," prepared under direction of Hon. J. T. Henderson, Commissioner, at Atlanta, Georgia:

Districts.	Temperature. Highest.	Lowest.	Monthly means.	Average precipitation.
	°	°	°	*Inches.*
Northern Georgia	88	42	67.4	7.06
Middle Georgia	92	54	72.7	8.36
Southwestern Georgia	94	64	72.3	5.66
Eastern Georgia	88	56	70.1	5.42
Southeastern Georgia	92	68	77.9	20.75
State	94	42	72.5	9.43

The rainfall of September has been excessive, and damaging to the crops in all parts of the state. In middle and southeast Georgia there has been about three times the usual amount for September. On the 19th, at Saint Mary's, there was a fall of over 5.5 inches; on the 26th, at Brunswick, 4.75 inches; and on the 20th, 3.5 inches at La Grange, and 4 inches on Lookout Mountain. At Saint Mary's a total rainfall of 27 inches was recorded for the month. The total mean for the month, in inches, in north Georgia is 7.04; in middle Georgia, 8.36; in southwest Georgia, 5.66; in east Georgia, 4.42; and in southeast Georgia, 20.73.

The average precipitation of rain for September, as deduced from the meteorological observations of a series of years, in north Georgia is 4.25 inches; in middle Georgia, 2.71; in southwest Georgia, 4.20; in east Georgia, 4.08; in southeast Georgia, 7.03; and the average for the state, 4.45.

The following meteorological summary and accompanying remarks are from the September, 1885, report of the "Indiana Weather Service," under direction of Prof. H. A. Huston, of Purdue University, Lafayette:

Districts.	Temperature. Highest.	Lowest.	Monthly mean.	Precipitation.
	°	°	°	*Inches.*
Northern counties	95.0	34	61.62	3.30
Central counties	88.0	33	63.33	3.37
Southern counties	93.0	37	65.57	5.05
State	95.0	33	63.51	3.91

The mean temperature of the state for September is 6°.42 below that for September of last year; 0°.19 above the mean of fourteen years at Indianapolis; 2°.25 below the mean of twenty-six years at Logansport; 5°.19 below the mean of twenty-one years at Vevay; 0°.19 below the mean of thirty-two years at Spiceland; 1°.84 below the mean of six years at Mauzy; 4°.57 below the mean of four years at Blue Lick; 3°.30 below the mean of four years at Worthington; 4°.84 below the mean of two years at Knightstown; and 1°.70 below the mean of six years at this station. With two exceptions the temperatures at the various stations are below the average, ranging from 0°.5 to 2°.7.

The mean precipitation for the state is 0.47 inch below that for last year; 1.11 above the mean of fourteen years at Indianapolis; 1.01 above the mean of twenty-six years at Logansport; 0.48 above the mean of twenty-one years at Vevay; 0.54 above the mean of twenty-six years at Spiceland; 1.25 above the mean of six years at Mauzy; 0.03 above the mean of four years at Blue Lick; 0.39 above the mean of four years at Worthington; and 0.84 above the mean of two years at Knightstown; and 1.31 above the mean of six years at this station. Six stations report rainfall above the mean, 0.35 to 2.22 inches, and three report rainfall below the mean, 0.19 to 1.31 inches.

Nearly every station reports severe weather on the 8th, the date of the tornado in Ohio.

The following is the "Iowa Weather Bulletin" for September, 1885, prepared by Dr. Gustavus Hinrichs, director of the Iowa Weather Service:

September, 1885, was nearly normal in temperature and cloudiness, southerly winds prevailing. The first twelve days were cold and very rainy; the balance of the month was remarkably fine and warm till the 28th, when another rainy spell began. No general frost has occurred yet, and the corn crop of this year is safe.

The mean temperature of the month was one-fifth of a degree above normal. The first decade was very cold, being ten degrees below normal. The first frost of the season occurred on the 5th, in northern Iowa, where the corn was nipped on lowlands. The second and third decades were quite warm, being five and a half degrees above the normal temperature of the season.

The total rainfall at the central station was but three-fourths of the normal amount. In southern and central Iowa the rainfall has considerably exceeded the normal, doing much damage to grain-stacks and interfering with the fairs held during the first twelve days of the month.

From the 13th to the 27th, inclusive, the weather has been generally warm, dry, and very beautiful. Threshing and all other early fall work was favored, and the great corn crop ripened.

No severe wind-storm has occurred in Iowa. On the day of the tornado at Washington Court House, Ohio, the weather was cold and rainy in Iowa.

Northern lights were seen on the 15th. The haze was most general after the extended prairie fires in Dakota Territory.

The following is an extract from the September, 1885, report of the "Minnesota Weather Service" under direction of Prof. Wm. W. Payne, Northfield:

Reports from the sixteen stations of the Minnesota Weather Service give an average mean temperature for Minnesota, for September, of 58°.7. This is only 4°.4 lower than for the preceding month of August.

The warmest station was La Crosse (61.°1), situated in the southeastern corner of the state, at the lowest elevation of any station, and sheltered by the high hills which there enclose the valley of the Mississippi River. The next warmest was Winona, situated under the same conditions.

The highest temperature of the month was registered at Morris, Stevens county, 93°.0; the next highest was at Moorhead, where 92° was recorded. It

will be seen that these stations are in the northwestern part of the state. These are very high temperatures for the season, but they have been exceeded in that region several times since observations have begun.

The lowest degree of heat was at Park Rapids, Hubbard county, where, on the 4th, 22°.2 was recorded. The next lowest was at Saint Vincent, Kittson county, 24°. The lowest average was also at Saint Vincent, 53°.1, and the next lowest at Duluth, 53°.9.

The average temperature varied but slightly from the normal in any part of the state, being slightly above the average at most stations in the west and in the Red River Valley. The only considerable departure from the normal was at Duluth, where the month averaged 2°.1 colder than usual. The abnormal cold of the last thirteen days of August was continued into the first seven days of the month, during which time, with the exception of the 2d, frosts of more or less severity were of nightly occurrence throughout all sections. After the 8th the weather became warmer, and a season of delightful, warm weather, free from frost, continued until the last day of the month, when a slight cold wave made its appearance, causing frosts in the northern part of the state. South of a line drawn from Morris, Stevens county, through Mankato and a little north of Winona, the average temperature of the month was above 60°, except for the elevated counties of Dodge and Freeborn, where it was slightly below that point. North of that line the average was below that point.

The rainfall for September was quite evenly distributed throughout all sections. In the extreme northwest there was less than one inch. In all other districts it was over two inches. The belt of greatest precipitation was in the central-eastern part of the state, and included the counties of Goodhue, Rice, and Blue Earth. The counties of Winona and Fillmore also had over four inches of rainfall. The largest amount recorded was at Minneapolis, 5.27 inches, and the next La Crosse, where 5.78 inches was measured. The least amount was at Saint Vincent, 0.98 inches, and next Morris, 2.16 inches.

The rain was very unevenly distributed throughout the month, and was nearly all included in three rainy terms. The first of these terms was on the 7th, 8th, and 9th, when, during that time, southern Minnesota was enveloped in the northwest quadrant of a cyclone, which, during those dates, passed from Las Animas, Colorado, to the Saint Lawrence. This cyclone gave rise to conditions which produced disastrous tornadoes in Ohio, causing the loss of six lives and doing $1,000,000 of damage. In Minnesota its energy was expended in producing heavy rains, and on these dates the long local drouth at Mankato was terminated by a rainfall of 2.17 inches. On the 11th and 12th the barometer was again very low, and general rains fell throughout the state, the largest amount falling in the northern sections. On the 19th, without any marked depression of the barometer, heavy rain was incident to that part of the state southeast of Saint Paul, and along the Mississippi River. The last decade of the month was without rain.

An examination of the records show that the first killing frost south of the 45th parallel occurred on the morning of the 5th, when, with the exception of Saint Vincent and Park Rapids, the lowest temperatures for the month were recorded at all stations. This frost was severe enough to kill corn and tender vegetation. Throughout the southern part of the state, notable exceptions to this were the limited localities of high-lying ground in the northern part of Dakota county, and the land elevated 1,300 feet above the sea south of Saint Charles, Olmsted county, where at the end of the month the corn and sugar-cane were still green and untouched by frost.

The following is an extract from the September, 1885, report of the "Missouri Weather Service," under direction of Prof. Francis E. Nipher, Saint Louis:

September has had a temperature slightly below the normal of forty-eight years, although a degree above the average of the last ten years. The extremes of temperature were 42° and 89°, which are very common temperatures for September. The early part of the month was cool and unusually wet, the rainfall for the first decade having been fifty per cent. more than the normal for the month. The second decade was warm, and in general fair, although the rain of 2.74 on the 13th was nearly as much as the normal rainfall for the whole month. The last decade was dry and slightly cooler than the second, and slightly warmer than the first, decade. The heaviest rainfall of the month was 3.45, on the 4th.

The total rainfall of the month was 8.62, which has been exceeded but once in September since 1839, viz., in 1863, when the rainfall was 10.53.

In the state the rainfall exceeded seven inches in a belt stretching southwestwardly from Saint Louis to Springfield, and extending northwardly to Sedalia and Mexico. To the north and south the fall diminishes to less than four inches. The lowest temperatures observed in the state were 42°, at Miami, and 43°, at Glasgow. Very light hoar frosts are reported from a few stations, but tender plants like the castor-oil bean are uninjured. At Saint Louis the temperature of the air has never been known to fall below 35° in September.

The highest temperatures reported from stations are, Protem, 95°; Orogon and Miami, 90°. In 1864, on the 2d and 3d, Engelmann observed a temperature of 102°, and in 1881, on the 4th and 5th, a temperature of 100° was also reached.

The following is an extract from the September, 1885, report of the "Nebraska Weather Service," under direction of Prof. Goodwin D. Swezey, Crete, Nebraska:

September has been in no respect a marked month, the temperature, precipitation, cloudiness, and number of storms of all kinds being about normal. The extremes of temperature have not been as great as usual, and the wind record has also been small.

No cold waves have developed during the month. On the 5th a cool wave overspread the states east of us and moved towards the Gulf, accompanied by a slight fall of temperature in our region. On the 22d a decidedly cool wave, extending from Lake Superior to Colorado, advanced southeastward to the Gulf and Atlantic coast, disappearing on the 24th; another came from the Pacific coast and moved eastward over the Rocky Mountains to our region, disappearing in the Missouri Valley on the 27th; another slight cool wave overspread Dakota and the upper lake region during the 29th and 30th, lowering the temperature in our region a few degrees. The second cool wave mentioned was accompanied by frosts in some parts of Nebraska.

The average rain for the different sections of the state for September, 1885, is as follows: Northeast section, 2.37 inches; southeast section, 2.37 inches; northwest section, 2.62 inches; southwest section, 1.99 inches. Greatest number of days of appreciable precipitation, 9, at Stromsburg and De Soto.

The following is an extract from the September, 1885, "Bulletin of the New England Meteorological Society," under direction of Prof. Winslow Upton, Providence, Rhode Island:

General conditions.—The month was characterized by fair skies, low temperature, and a large deficiency in rainfall. Frosts came early in the month and were numerous until its close, but they were generally light, and but little damage to crops resulted from them.

Precipitation.—The precipitation was light, but one station reporting an excess over the average of former years. The total precipitation for the whole district was about 55 per cent. of the usual amount for September. The rainfall came in connection with the passage of the barometric depressions mentioned below, with the exception of a very few local showers on other days. The chief peculiarity of the precipitation record is the amount of snow which fell in the severe storm of the 22d–24th in New Hampshire and Vermont. At places where no stations are located the snow was abundant, especially in mountainous sections. At Strafford, Vermont, the greatest amount, 9 inches, was noted, and the snow remained on the ground two days. The distribution of the precipitation for the month was irregular, but the northern portion received a greater amount than the southern.

Temperature.—Without a single exception, the stations for which comparisons with former records are available show a deficiency in the average for the month. The average deficiency is 2°.7. The cold weather began early in the month, extensive but light frosts occurring on the 2d and 3d instants. The minimum temperatures were generally in connection with the severe storm of the 22d–24th, when the temperatures noted were near the freezing point.

Pressure.—Three barometric depressions passed in the vicinity of the district during the month, while the rainfall of the 1st and 2d instants was in connection with the depression which passed north of New England on the 31st ultimo. Of these, two moved down the Saint Lawrence Valley on the 3d and 9th, respectively, with the usual attendant conditions, but the third merits a more detailed description. On the 18th indications of a cyclonic disturbance in the Gulf of Mexico were first noted. On the morning of the 22d this storm-centre, moving in a northeasterly direction along the south Atlantic coast, had reached Cape Hatteras. At the same time a second depression, moving easterly over the Lake region, had reached the Province of Quebec. The pressure at the centre of each depression was about 29.5 inches. During the 22d these depressions united over New England, and on the morning of the 23d a single depression existed near Eastport, where the pressure was only 28.76 inches. This storm was the only severe storm of the month. It was attended by rain and high winds; after its passage, before the precipitation had ceased, the temperature fell with great rapidity, causing the precipitation of the 23d to be, in part, snow. This storm furnishes an excellent example of the union of two barometric depressions within the limits of the United States.

Wind.—Severe gales attended the cyclonic disturbance just described. Velocities exceeding thirty miles per hour were as follows: Saint John, 34; Boston, 37; Block Island, 37; Eastport, 40; Blue Hill, 64; Mount Washington, 90. Among the total wind movements for the month are: Saint John, 6,027; Boston, 6,977; Blue Hill, 12,106; Mount Washington, 21,265 miles.

Thunder-storms.—Thunder and lightning accompanied the passage of all the depressions mentioned above, but were noted at a few stations only. In addition, thunder-showers occurred in eastern Massachusetts on the 16th, and in New Brunswick on the 19th. No wide-spread or severe thunder-storms occurred during the month.

Miscellaneous.—Auroras were frequently observed, those of the 14th and 15th having been generally reported. Other dates of observation are: Eastport, 2d, 3d, 4th, 17th; Saint John, 3d, 4th; Provincetown, 1st, 2d; Mayfield, 11th, 13th; Gardiner, 3d; Manchester, New Hampshire, 17th; Woodstock, Vermont, 17th; Cambridge, 5th; Parker's Ridge, 17th.

Prof. B. F. Thomas, of the Ohio State University, Columbus, director of the "Ohio Meteorological Bureau," forwards the following meteorological summary in advance of the regular monthly report:

Temperature.—Mean for the state, as determined from observations at thirty-two stations, 62°.9; station reporting highest monthly mean, Pomeroy, 66°.9; station reporting lowest monthly mean, Youngstown, 60°.0; maximum, 95°.0, at College Hill, on the 19th; minimum, 28°.0, on the 2d, at Junction; monthly range for the state, 67°.6; station reporting greatest monthly range,

Junction, 58°.0; station reporting least monthly range, Oberlin, 40°.0; stations reporting greatest daily range, College Hill and Hanging Rock, 46°.0, on the 25th; station reporting least daily range, Hiram, 3°.0, on the 10th.

Relative humidity.—Mean for the state, as determined from observations at thirty stations, 75.9 per cent.; station reporting highest monthly mean, Logan, 83°.7 per cent.; station reporting lowest monthly mean, Napoleon, 59.5 per cent.

Precipitation.—Average for the state, as determined from observations at thirty-three stations, 2.49 inches; station reporting largest monthly amount, Upper Sandusky, 3.87 inches; stations reporting least monthly amount, Pomeroy, 0.98.

Winds.—Prevailing direction, southwest. Twenty-nine stations report prevailing winds, as follows: sixteen from southwest; five from southeast; three from west; three from east; one from south and one from northwest.

The following is an extract from the Tennessee "State Board of Health Bulletin" for September, 1885, prepared under the direction of J. D. Plunkett, M. D., president, State Board of Health, and furnished in advance of the regular report:

The mean temperature for the month was 69°.52, 3°.68 below that for the corresponding month last year, and 2° above the mean for September, 1883. The mean of the maximum temperatures was 88°.26, and the mean of the minimum temperatures was 44°.87, respectively, 3°.14 and 6°.13 below those for the corresponding period last year. The highest temperature, which was recorded about the 12th, was slightly below the maximum for September of the past two years. The lowest temperature was recorded on the 24th, at which time slight frosts were reported from most of the stations.

The average precipitation for the month was 3.80 inches, 1.73 inches above the precipitation for the corresponding months of 1883 and 1884. In the eastern division of the state the rainfall was very near the normal, but in the middle and western divisions it was considerably above, especially in the latter. In the distribution, the conditions of last month were almost reversed, the western division receiving an average of 4.20 inches, the middle division receiving 3.80 inches, and the eastern division receiving 3.40 inches. The days of greatest rainfall were the 8th, 13th, 20th, 27th, 28th, 29th, and 30th, of these, the greatest fall occurred on the 29th, when an average of .87 inch fell throughout the state. The local rains of this date were very heavy at several stations, at least four reporting two or more inches. The greatest local daily fall was at Waynesborough, where 3.65 inches were reported on the above date. The above-named rains were general, but those of the 27th, 28th, and 29th were very light in the eastern division. There were only four rainless days reported during the month, the 10th, 11th, 24th, and 25th.

State summary.

Mean temperature, 69°.52; highest temperature, 93°.00, on the 12th, at Waynesborough; lowest temperature, 34°.00, on the 24th, at Hohenwald; range of temperature, 59°.00; mean monthly range of temperature, 43°.32; greatest monthly range of temperature, 58°.00, at Hohenwald; least monthly range of temperature, 34°.00, at Dickson; mean daily range of temperature, 15°.58; greatest daily range of temperature, 41°, on the 24th, at Riddleton; least daily range of temperature, 2°, on the 8th, at Hurricane Switch, on the 13th, at Bolivar, on the 20th, at Dickson, on the 21st, at Jonesborough, on the 27th, at Ashwood, on the 28th, at Greenville, and on the 30th, at Grief, Riddleton, and Florence Station; mean of maximum temperatures, 88°.26; mean of minimum temperatures, 44°.87.

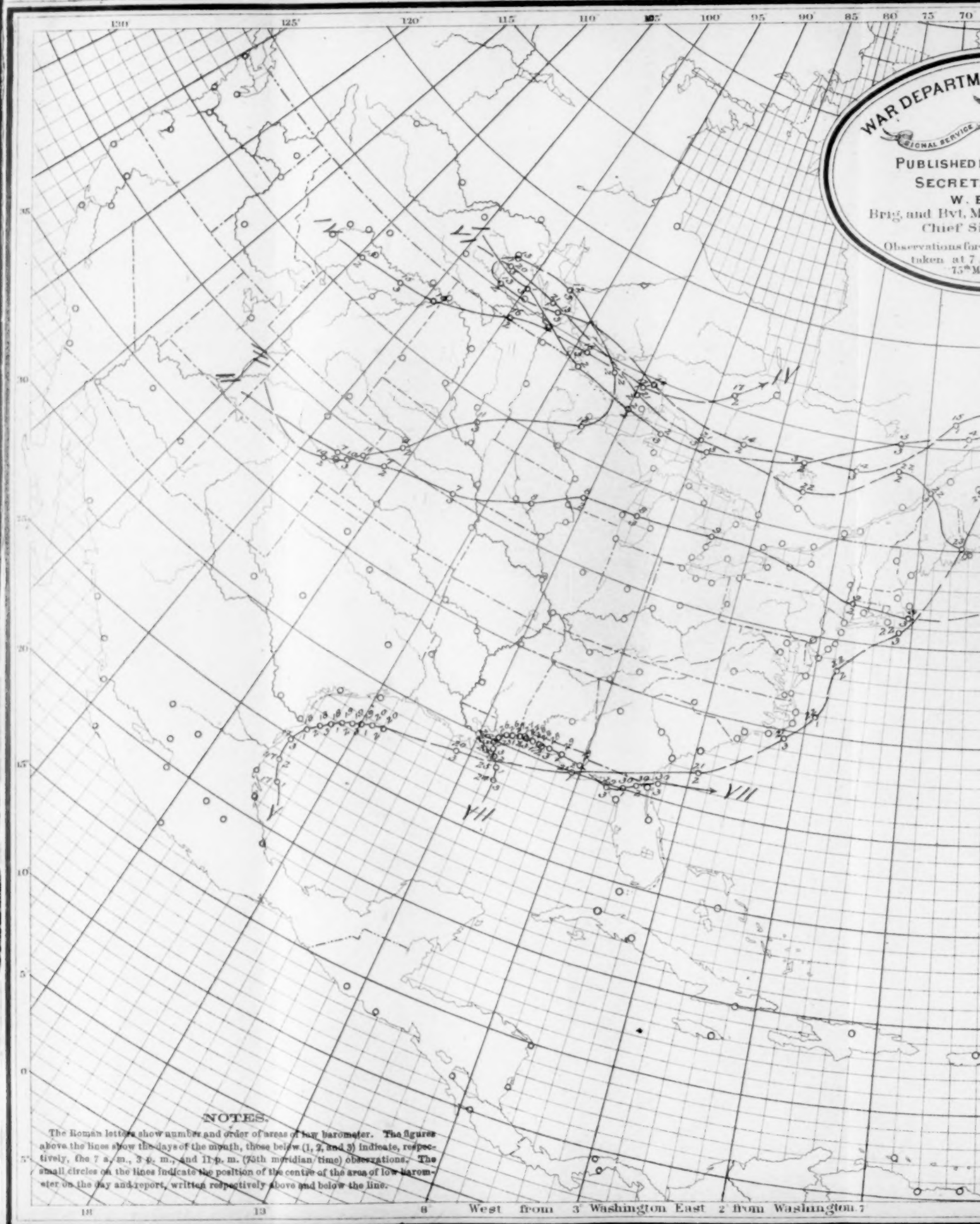
Mean depth of rainfall, 3.80 inches; mean daily rainfall, 0.127 inch; greatest rainfall, 6.66 inches, at Waynesborough; least rainfall, 0.55 inch, at Jonesborough; greatest local daily rainfall, 3.65 inches, on the 29th, at Waynesborough; days of greatest rainfall, 8th, 13th, 20th, 27th, 28th, 29th, and 30th; day of greatest rainfall, 29th.

Average number of days on which rain fell, 9.5; average number of clear days, 10; average number of fair days, 8.2; average number of cloudy days, 11.8; rainless days, 10th, 11th, 24th, 25th; warmest day, 12th; coldest day, 24th.

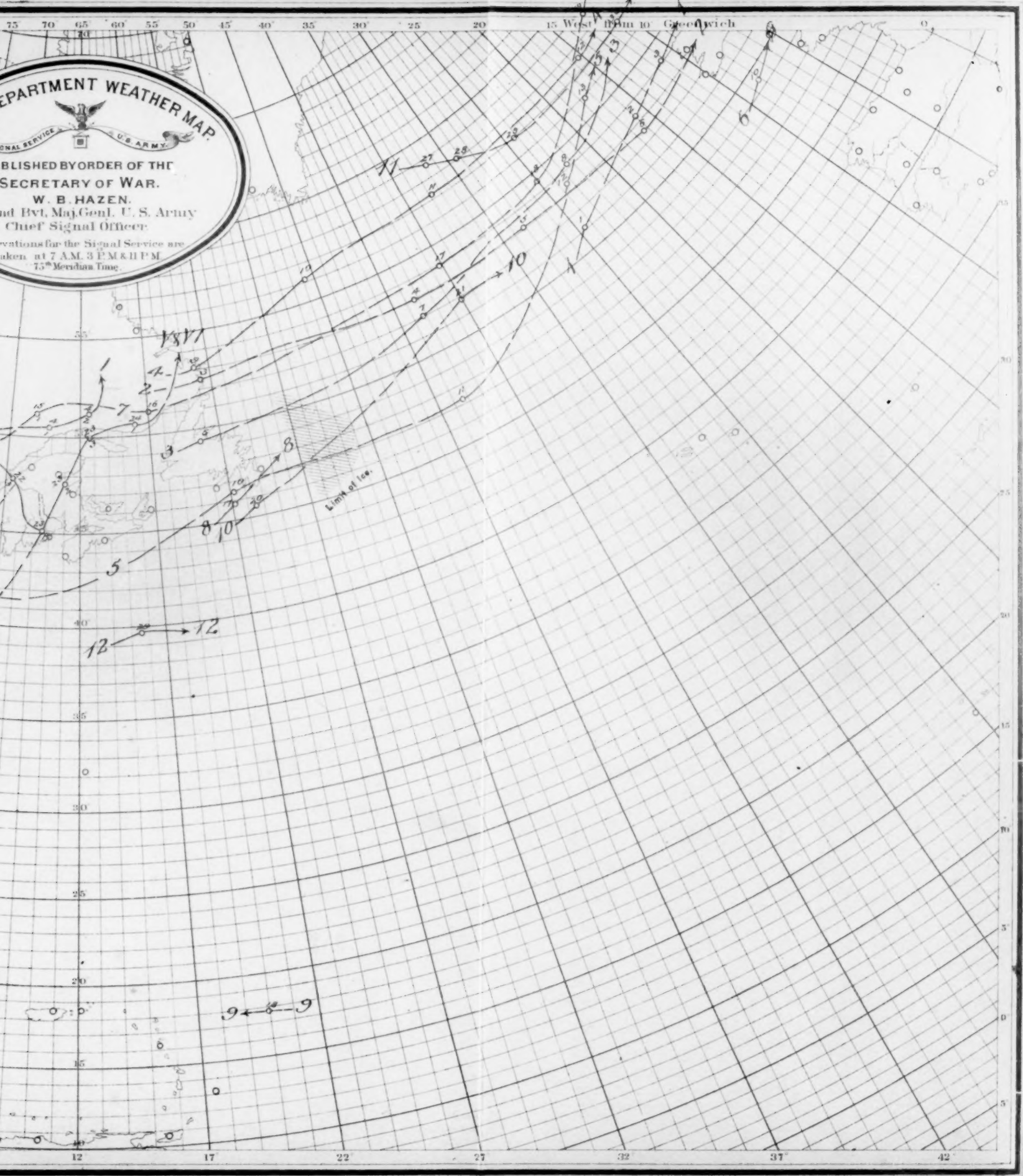
Prevailing winds, south and southeast.

Chart I. Tracks of Cycl

Form 106 C 1884.


WAR DEPARTM
SIGNAL SERVICE
PUBLISHED
SECRET
W. B
Brig. and Bvt. M
Chief Si
Observations for
taken at 7
75th M
IV
VII
VII
V
NOTES.
The Roman letters show number and order of areas of low barometer. The figures above the lines show the days of the month, those below (1, 2, and 3) indicate, respectively, the 7 a. m., 3 p. m., and 11 p. m. (75th meridian time) observations. The small circles on the lines indicate the position of the centre of the area of low barometer on the day and report, written respectively above and below the line.
West from Washington
East from Washington

# of Cyclonic Areas, September, 1885.

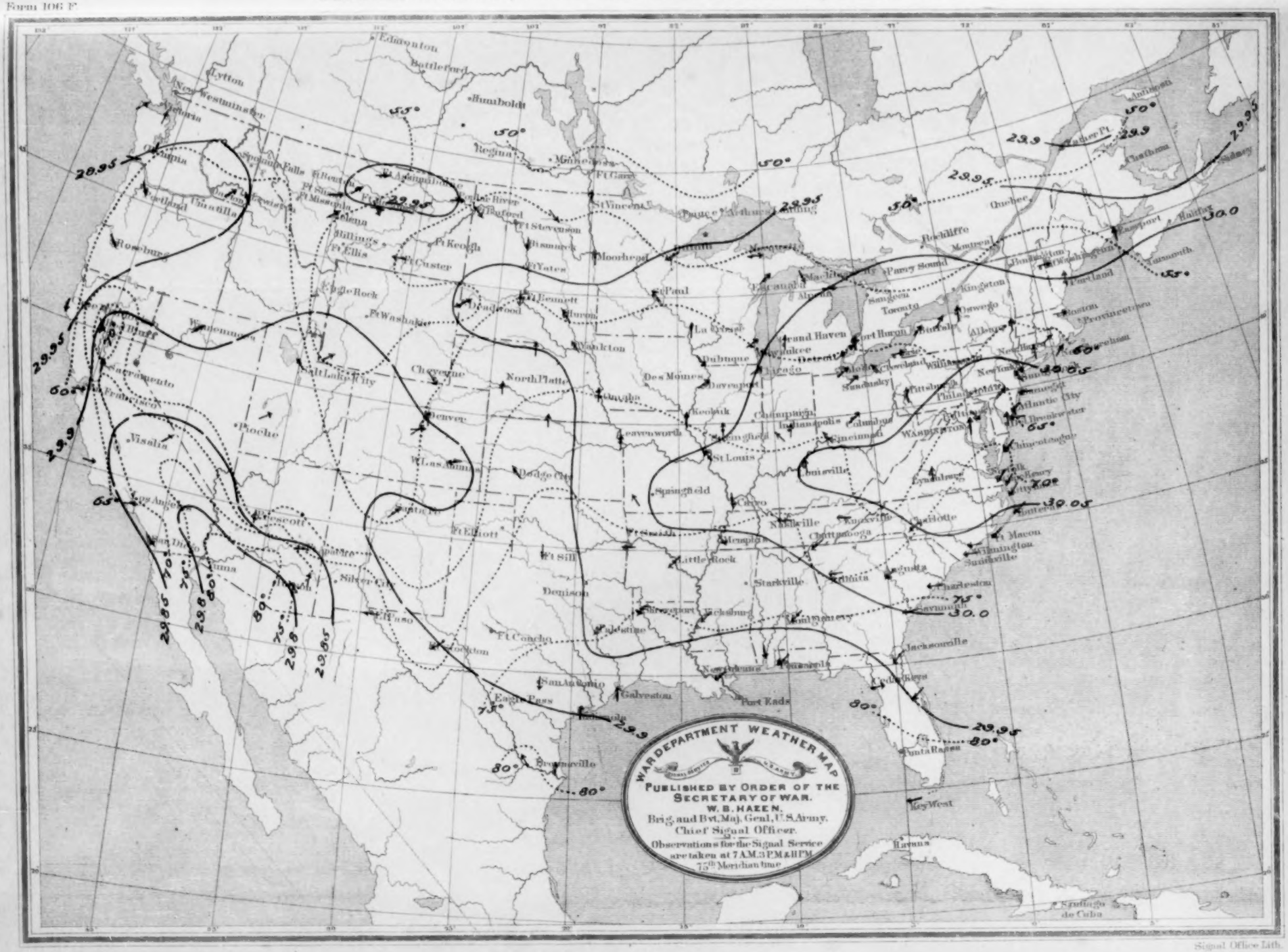

EPARTMENT WEATHER MAP.
ONAL SERVICE U.S. ARMY.
BLISHED BY ORDER OF THE
SECRETARY OF WAR.
W. B. HAZEN.
nd Bvt. Maj. Genl. U. S. Army
Chief Signal Officer.
vations for the Signal Service are
aken at 7 A.M. 3 P.M & 11 P.M.
75th Meridian Time.
Limit of Ice.
15 West from 10 Greenwich

Signal Office Lith.

Chart II. Isobars, Isotherms, and Winds. September, 1885

Form 106 F

Chart II. Isobars, Isotherms, and Winds. September; 1885

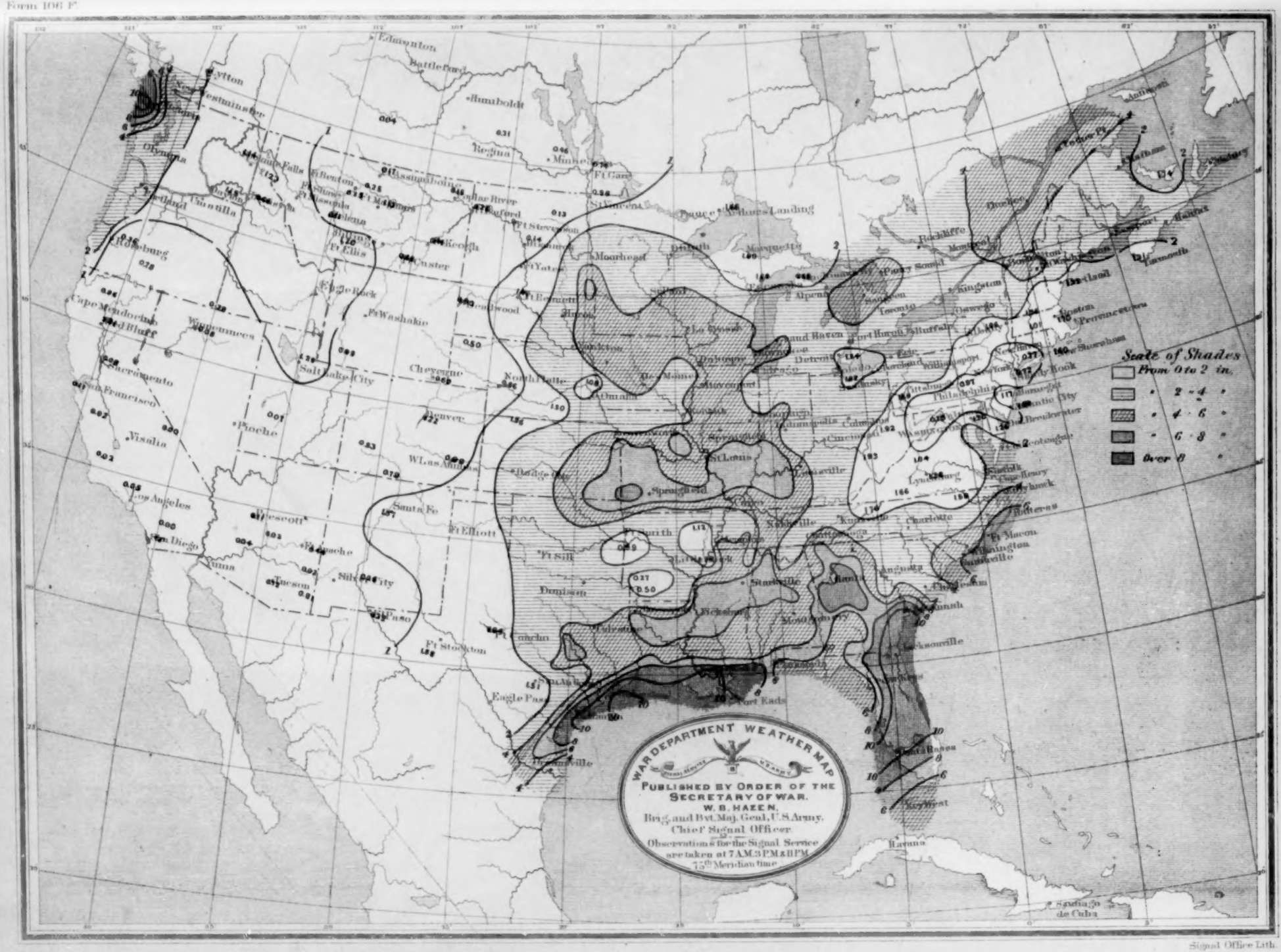


Signal Office Lith.

Chart III. Precipitation, September, 1885

Form 106 F.

Chart III. Precipitation, September; 1885


Scale of Shades
From 0 to 2 in.
" 2 - 4 "
" 4 - 6 "
" 6 - 8 "
Over 8 "
WAR DEPARTMENT WEATHER MAP
PUBLISHED BY ORDER OF THE SECRETARY OF WAR.
W. B. HAZEN,
Brig. and Bvt. Maj. Genl. U.S. Army,
Chief Signal Officer.
Observations for the Signal Service are taken at 7 A.M. 3 P.M. & 11 P.M. 75th Meridian time.

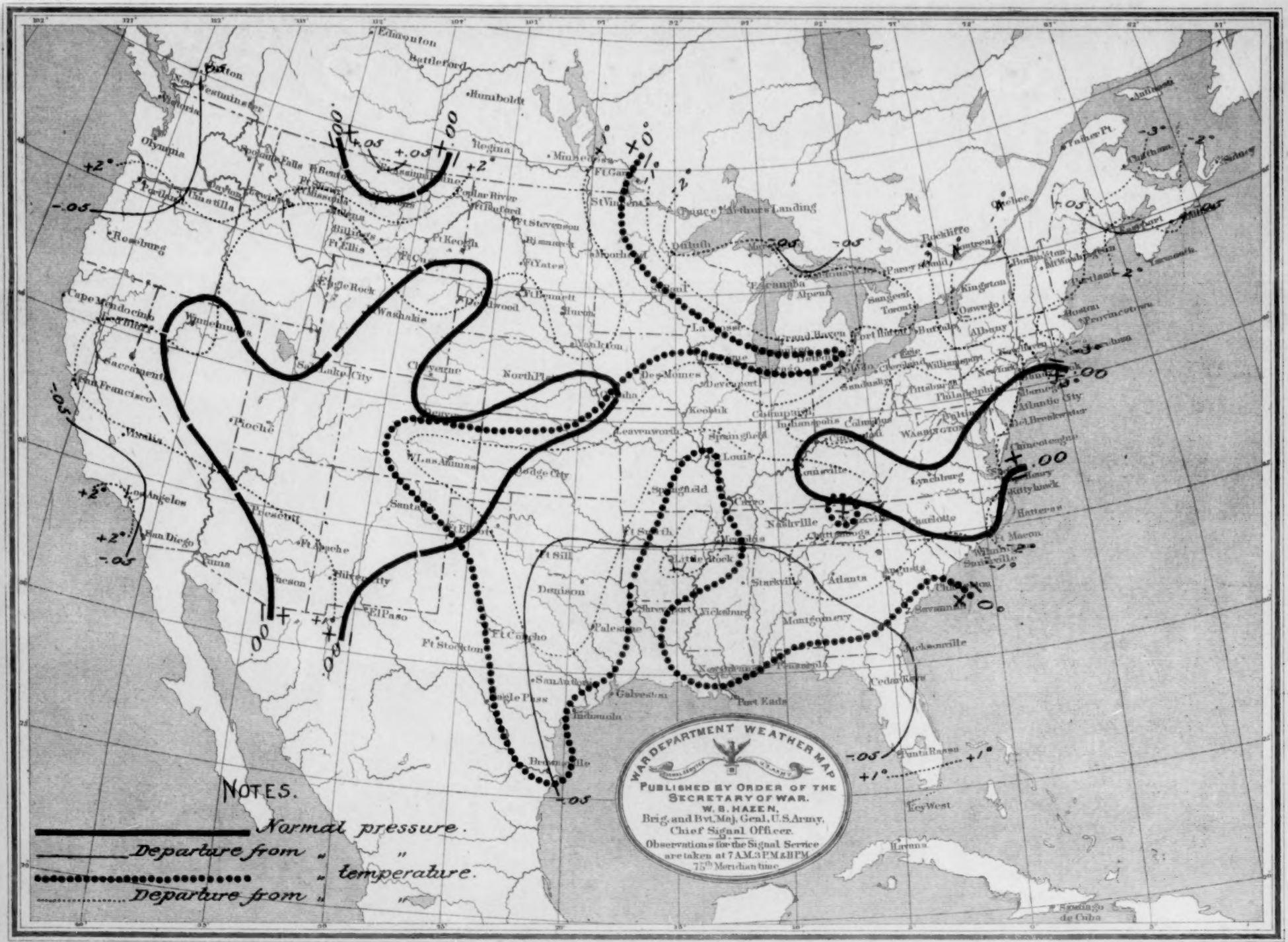
Signal Office Lith.

Form 806 F

Chart IV. Departures from Normal Atmospheric Pressure and Temperature. September, 1885.

Form 106 F.

Chart IV. Departures from Normal Atmospheric Pressure and Temperature. September, 1885.



Voluntary observers of the Signal Service, on land, from whom meteorological reports were received in time to be used in the preparation of the Monthly Weather Review for September, 1885.

Observer and place of observation.

Alexander, S., Birmingham, Mich.
Anderson, Dr. W. W., Stateburg, S. C.
Altaffer, J. M., Independence, Kans.
Adams, Dr. O. H., Vineland, N. J.
Abbott, Dr. E. K., Salinas, Cal.
Arents, Hiram, Oroville, Cal.
Avery, O. H., Oskaloosa, Iowa.
Achillion, R., Clear Lake, Ark.
Bisbee, Capt. Lewis, Buckfield, Me.
Boerner, Prof. Chas. G., Vevay, Ind.
Bowman, P., Savannah, Ohio.
Ballou, Dr. N. E., Sandwick, Ill.
Boynton, John F., Syracuse, N. Y.
Bayerly, J. F., Spartanburg, S. C.
Bennett, Geo, Bandon, Oreg.
Beloit College, Beloit, Wis.
Bell, Joseph, Franklin, Pa.
Brainerd, Dr. H. G., Independence, Iowa.
Baker, Dr. Henry B., Lansing, Mich.
Beall, Dr. R. L., Lenoir, N. C.
Brendel, Dr. Fred., Peoria, Ill.
Bentley, David, Princeton, Cal.
Bartlett, E. B., Vermillion, N. Y.
Baldwin, A. L., Bethel, Conn.
Briggs, John, Albany, Oreg.
Betts, Prof. Arthur, Webster, Dak.
Breed, J. E., Embarras, Wis.
Baker, Dr. L. J., Ottumwa, Iowa.
Boyd, Joseph, Oskaloosa, Iowa.
Beebe, A., Manistique, Mich.
Blachly, C. P., Manhattan, Kans.
Beecher, Chas., Wysox, Pa.
Charbonnier, Prof. L. H., Athens, Ga.
Cook, S. A., Milledgeville, Ga.
Cotton, Dr. D. B., Portsmouth, Ohio.
Clark, A. C., Wausau, Wis.
Casey, Geo., Auburn, N. Y.
Crawford, E. A., Liberty Hill, La.
Curtiss, G. G., Fallston, Md.
Cornell University, Ithaca, N. Y.
Cutting, Dr. Hiram A., Lunenburg, Vt.
Crosier, Adam, Laconia, Ind.
Caulkins, John S., Thornville, Mich.
Clark, T. A., Weldon, N. C.
Chandler, Dr. W. J., South Orange, N. J.
Cass, John J., Allison, Kans.
Couch, E. D., Contoocook, N. H.
Carleton College, Prof. W. W. Payne, director, Northfield, Minn.
Cleveland, Dr. G. H. Pentwater, Mich.
Capen, F. S., Waterville, Me.
Carpenter, Dr. W. B., Leavenworth, K.
Christ, Jacob, Franklin, Wis.
Cheney, Wm., Minneapolis, Minn.
Cocke, A. R., Indianola, Iowa.
Culver, G. E., Vermillion, Dak.
Carter, Rev. Dr. W. H., Tallahassee, Fla.
Comstock, Prof. F. M., Le Roy, N. Y.
Carmody, Prof. C. M., Emmittsburg, Md.
Cooper, Dr. Geo. C., Manatee, Fla.
Corbin, F. E., Dudley, Mass.
Chubbs, Thos H., Post Mills, Vt.
Cole, Seward, Cahuenga, Cal.
Cutler, B. B., Heath, Mass.
Chapin, Adams, Poway, Cal.
Childs, W. H., Brattleborough, Vt.
Davis, Jacob, Rowe, Mass.
Dickinson, Jas. B., Guttenberg, Iowa.
Deming, H. D., Wellsborough, Pa.
Dozier, Wm., Mattoon, Ill.
Dewhurst, Rev. E., Voluntown, Conn.
Dunlap, W. L., Tecumseh, Nebr.
Day, Theodore, Dyberry, Pa.
Dawson, Wm., Spiceland, Ind.
Dunton, Lieut. W. R., Dorset, Vt.
Davenport, C. B., North Stamford, Conn.
Dow, Roswell, Sycamore, Ill.
Dinsmore, jr., Prof. T. H., Emporia, Kans.
Dudley, C. B. Altoona, Pa.
Doton, Hosea, Woodstock, Vt.
Dunlap, J. B., Charleston, Ill.
Dechant, Wm. H., Mahanoy Plane, Pa.
Eliason, W. A., Statesville, N. C.
Eckstein, Rev. M., Conception, Mo.
Ellis, John, Marquette, Nebr.
Ellsworth, W. W., Hartford, Conn.
Everett, Dr. J. T., Clyde, Ohio.
Ewell, Dr. M. D., South Evanston, Ill.
Fernald, Prof. M. C., Orono, Me.
Ferris, B. F., Sunman, Ind.
Fouch, Dr. A., College City, Cal.
Fuller, E. N., Tacoma, Wash. T.
Fox., F. E., Fall Brook, Cal.
Fox, G. W., Murrieta, Cal.
Friend, Chas. W., Carson City, Nev.
Fleming, J., Readington, N. J.
Field, Thos. G., Parkersburg, W. Va.
Gordon, Dr. G. G., Swartz Creek, Mich.
Gunn, J. Newton, Springfield, Ohio.
Gates, W. B., Burlington, Vt.
Grathwohl, John, Blooming Grove, Pa.
Gillingham, Milnor, Fallsington, Pa.
Gardiner, R. H., Gardiner, Me.
Gowey, H. D., North Lewisburg, Ohio.
Gibson, John H., Salina, Kans.
Green, Dr. Jesse C., West Chester, Pa.
Gerrish, S. H., Sacramento, Cal.
Gray, J. W., Stockham, Nebr.
Gibbs, Geo. J. Grand Turk Id., B. W. I.
Goodwin, Wm., North Colebrook, Conn.
Gray, F. R., Yates Centre, Kans.
Gillingham, W., Accotink, Va.
Garlick, Rev. Dr. J. R., Bruington, Va.
Gray, Capt. A. W., Kenewick, Wash. T.
Heath, E. R., Wyandotte, Kans.
Horn, Dr. H. B., Atchison, Kans.
Hiram College, Hiram, Ohio.
Harvard College Observatory, Cambridge, Mass.
Hammitt, John W., College Hill, Ohio.
Heaton, Isaac E., Fremont, Nebr.
Helm, Thos. B., Logansport, Ind
Hoskinson, R. M., Bainbridge Island, Wash Ter.
Hyde, G. A., Cleveland, Ohio.
Hunter, Dr. T. C., Napoleon, Ohio.
Haywood, John, Westerville, Ohio.
Hassler, B. K., Chambersburg, Pa.
Hartzler, J. A., Mottville, Mich.
Hall, J. B., Worcester, Mass.
Hager, Mrs. L. G., Terre Haute, Ind.
Howe, Prof. J. L., Richmond, Ky.
Hoyt, F. C., Easton, Pa.
Houghton Farm Experiment Station, Mountainville, N. Y.
Heatwole, L. J., Dale Enterprise, Va.
Harper, Geo. W., Cincinnati, Ohio.
Hazen, Rev. A. Deerfield, Mass.
Hamilton, W. H., Corsicana, Texas.
Hatch, A. H., Windsor, Ill.
Harris, W. C., Dover, N. J.
Hickman, E. A., Independence, Mo.
Hodge, Rev., F. B., Wilkesbarre, Pa.
Housekeeper, H. S., S. Bethlehem, Pa.
Humphrey, Dr. I., Fairbury, Nebr.
Hurlin, Rev. Wm., Antrim, N. H.
James, John W., Marengo, Ill.
Jones, Dr. E. U., Taunton, Mass.
Jackson Company, Nashua, N. H.
Jordan, Dr. M. D. L., Milan, Tenn.
Jones, Ira B., Neillsville, Wis.
Knapp, J. G., Limona, Fla.
Keese, G. Pomeroy, Cooperstown, N. Y.
Kuhne, F. W., Fort Wayne, Ind.
Keeler, W. F., Mayport, Fla.
King, W. R., Yellow Springs, Ohio.
Lueps, Miss Anna, Manitowoc, Wis.
Lincoln, A. T., Marion, Va.
Loomis, J. C., Jeffersonville, Ind.
Lay, Dr. F. H., Pueblo, Colo.
Luther, S. M., Garrettsville, Ohio.
Ladshaw, Geo. E., Pacolet, S. C.
Lovewell, Prof. J. T., Topeka, Kans.
Lamb, Miss Bertha E., Sterling, Kans.
McPherson, Wm., Ross Valley, Cal.
McDonogh Institute, McDonogh, Md.
McCready, Miss L. A., Fort Madison, Iowa.
Moore, C. R., Bird's Nest, Va.
Munn, A. M., Kalamazoo, Mich.
Metcalf, Dr. John G., Mendon, Mass.
McKenzie, Dr. M., Centreville, Mo.
Memminger, E. R., Flat Rock, N. C.
Mallory, Miss H. B., Corpus Christi, Tex.
Macrae, Colin, Kirkwood, S. C.
Meehan, Thos., Germantown, Pa.
Moore, Nathan, Grampian Hills, Pa.
Mikesell, Thos., Wauseon, Ohio.
McClintock, F., West Union, Iowa.
Marshall, G., Cresco, Iowa.
Mitchell, Dr. D. W., Harrisville, Mich.
Miller, H. D., Drifton, Pa.
Moore, Dr. J. W., Easton, Pa.
Neal, Dr. J. C., Archer, Fla.
Newbegin, John D., Anna, Ill.
Newcomb, G. S., Westborough, Mass.
Noll, A. B., Somerville, N. J.
Nordberg, A., Richardton, Dak.
Nicholson, Dr. A. W., Boyne, Mich.
Nourse, H. D., Washington, D. C.
Norcom, Prof. T. J., Reidsville, N. C.
Osborn, Dr. Thos. C., Cleburne, Tex.
Olds, H. D., Cedar Rapids, Iowa.
Owsley, Dr. J. B., Jacksonborough, O.
Parker, D., Humboldt, Iowa.
Pearce, Thomas, Eola, Oreg.
Porterfield, L. C., Tidioute, Pa.
Partrick, J. M., North Volney, N. Y.
Purdue University, La Fayette, Ind.
Pettersén, Dr. F., Comfort, Tex.
Pritchett, Prof. H. C., Huntsville, Tex.
Remington, C. V. S., Fall River, Mass.
Robertson, T. D., Rockford, Ill.
Rogers, F. M., Luling, La.
Renfrew, H. N., Wilton Center, Ill.
Rodman, Thos. R., New Bedford, Mass.
Rotch, A. L., Blue Hill, Mass.
Russell, Geo. W., Wellsburg, W. Va.
Runge, C., New Ulm, Tex.
Richardson, C. F., Beverly, N. J.
Shaw, J., Rochester, Minn.
Shriver, E. T., Cumberland, Md.
Seltz, Chas., De Soto, Nebr.
Scott, Thos. G., Forsyth, Ga.
Stucky, Dr. C. T., Helvetia, W. Va.
Stern, Jacob T., Logan, Iowa.
Slade, Elisha, Somerset, Mass.
Slenker, Mrs. E. D., Snowville, Va.
Scribner, H. F. J., Strafford, Vt.
Sargent, J. B., Leicester, Mass.
Strong, S. B., Setauket, N. Y.
Shriver, Howard, Wytheville, Va.
Somerville, W. B., Birmingham, Ala.
Samostz, Oscar, Austin, Tex.
Shahan, Chas. C., Columbus, Nebr.
Shepard, E. M., Springfield, Mo.
Smith, H. D., Monticello, Iowa.
Safford, A. T., Williamstown, Mass.
Sherman, W. B., Manchester, Iowa.
Smith, Rev. D. W., Troy, Pa.
Standenmayer, Dr. L. R., Lincolnton, N. C.
Snell, Miss S. C., Amherst, Mass.
Sim, John R., Summit, Va.
Spilman, J. J., Pierce City, Mo.
Stone, W. E., Amherst, Mass.
Swezey, Prof. G. D., Crete, Nebr.
Sacred Heart College, Prairie du Chien, Wis.
Trembley, Dr. J. B., Oakland, Cal.
Todd, Prof. David P., Amherst, Mass.
Teele, Rev. A. K., Milton, Mass.
Truman, Geo. S., Genoa, Nebr.
Turnbo, Silas C., Pro Tem, Mo.
Tillinghast, C. B., Albany, N. Y.
Turner, Ernest, Point Pleasant, La.
Thompson, R. J., Tiffin, Ohio.
Voegeli, Adolphus, Des Moines, Iowa.
Washburne Observatory, Madison, Wis.
Wild, Rev. E. P., Newport, Vt.
Williams, Rev. C. F., Ashwood, Tenn.
Wing, Miss M. E., Charlotte, Vt.
West, Silas, Cornish, Me.
Wylie, Wm., Mount Forest, Canada.
Walton, J. P., Muscatine, Iowa.
Wait, S. E., Traverse City, Mich.
Woodstock College, Woodstock, Md.
Wolfe, John H., Wellington, Kans.
West, Dr. Jos. O., Princeton, Mass.
Washington Aqueduct. — Receiving Reservoir, D. C; Distributing "; Great Falls Reservoir, Md; Rock Creek Bridge, D. C.
Winipiseogee Lake Cotton and Woolen Manufacturing Co. — Weir's Bridge, N. H.; Woodstock, N. H.; Wolfborough, N. H.; Lake Village, N. H.; Bristol, N. H.; Belmont, N. H.; Ashland, N. H.
Willis, O. R., A. M., Ph. D., White Plains, N. Y.
Watters, Dr. Jas., Westmoreland, Kan.
Went, E. C., Frankfort, Ky.
Williams, Dr. A. C., Elk Falls, Kans.
Wigg, Dr. Geo., East Portland, Oreg.
Wetmore, E. L., Tucson, Ariz.
Wright, J. W. A., Greensborough, Ala.
Whitmore, J. E., Gallinas Spring, N. Mex.
Wistrom, M. F., Harvard, Nebr.
Wadsworth, Dr. J. L. R., Collinsville, Ill.
Widman, Rev. C. M., Grand Coteau, La.
Williams, Dr. A. C., Elk Falls, Kans.
Watson, Evan, Fort Scott, Kans.
White, Rev. J. H., Merritt's Island, Fla.
Ward, J. B., Guilford, Ind.
Whitney, Chas. E., Humphrey, N. Y.
Whittington, G., Mount Ida, Ark.
Yetter, Wm. G., Catawissa, Pa.
Yates, T. P., Factoryville, N. Y.
Young, Geo. R., Penn Yan, N. Y.
Zimmerman, F. C., Bunker Hill, Ill.

Military posts from which meteorological reports were received, through the Surgeon General of the Army, in time to be used in the preparation of the Monthly Weather Review for September, 1885.

Alcatraz Island, Cal.
Angel Island, Cal.
Assinaboine, Fort, Mont.
A. Lincoln, Fort, Dak.
Benicia Barracks, Cal.
Bidwell, Fort, Cal.
Brady, Fort, Mich.
Bridger, Fort, Wyo.
Brown, Fort, Tex.
Buford, Fort, Dak.
Concho, Fort, Tex.
Columbus, Fort, N. Y.
David's Island, N. Y. H.
Ellis, Fort, Mont.
Fred Steele, Fort, Wyo.
Gaston, Fort, Cal.
Klamath, Fort, Oreg.
Keogh, Fort, Mont.
Lewis, Fort, Colo.
Lyon, Fort, Colo.
Mason, Fort, Cal.
Madison Barracks, N. Y.
McDermitt, Fort, Nev.
Monroe, Fort, Va.
Majave, Fort, Ariz.
McDowell, Fort, Ariz.
McHenry, Fort, Md.
Mount Vernon B'ks, Ala.
Meade, Fort, Dak.
Niagara, Fort, N. Y. [Cal.
Presidio of San Francisco,
Plattsburg Barracks, N. Y.
Pembina, Fort, Dak.
Preble, Fort, Me.
Randall, Fort, Dak.
Reno, Fort, Ind. Ter.
Robinson, Fort, Nebr.
Snelling, Fort, Minn.
Saint Augustine, Fla.
Sully, Fort, Dak.
Sisseton, Fort, Dak.
Shaw, Fort, Mont.
Totten, Fort, Dak.
Townsend, Fort, Wash. T
Union, Fort, N. Mex.
Wingate, Fort, N. Mex.
West Point, N. Y.
Yates, Fort, Dak.

State weather services from which meteorological reports were received in time to be used in the preparation of the Monthly Weather Review for September, 1885.

Alabama State Weather Service, under direction of Prof. P. H. Mell, jr., Auburn, Alabama.
Georgia State Weather Service, under direction of Hon. J. T. Henderson, Atlanta, Georgia.
Indiana State Weather Service, under direction of Prof. H. A. Huston, La Fayette, Indiana.
Iowa State Weather Service, under direction of Dr. Gustavus Hinrichs, Iowa City, Iowa.
Minnesota State Weather Service, under direction of Prof. W. W. Payne, Northfield, Minnesota.
Missouri State Weather Service, under direction of Prof. Francis E. Nipher, Saint Louis, Missouri.
Nebraska Weather Service, under direction of Prof. Goodwin D. Swezey, Crete, Nebraska.
New England Meteorological Society, Prof. Winslow Upton of Providence, R. I., President; Prof. W. M. Davis, of Cambridge, Mass., Secretary.
Ohio State Weather Service, under direction of Prof. B. F. Thomas, of the Ohio State University, Columbus, Ohio.
Tennessee State Weather Service, under direction of J. D. Plunkett, M. D., Nashville, Tennessee.
Data have also been used from meteorological records of the Central Pacific and Southern Pacific railway companies.

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